Resource Report 9 – Air and Noise Quality
AES Sparrows Point LNG Terminal
& Mid-Atlantic Express Pipeline

SUMMARY OF REQUIRED FERC REPORT INFORMATION		
TOPIC	**FERC Reference**	**Report Reference or Not Applicable**
1. Describe existing air quality in the vicinity of the project • Identify criteria pollutants that may be emitted above EPA-identified significance levels.	§ 380.12(k)(1)	Section 9.3.1
2. Quantify the existing noise levels (day-night sound level (L_{DB}) and other applicable noise parameters) at noise sensitive areas and at other areas covered by relevant state and local noise ordinances. • If new LNG terminal sites are proposed, measure or estimate the existing ambient sound environment based on current land uses and activities. • For existing LNG terminals (operated at full load), include the results of a sound level survey at the site property line and nearby noise-sensitive areas. • Include a plot plan that identifies the locations and durations of noise measurements • All surveys must identify the time of day, weather conditions, wind speed and direction, engine load, and other noise sources present during each measurement.	§ 380.12(k)(2)	Section 9.4.3 Figure 9.4-1 Appendix 9C
3. Quantify existing and proposed emissions of compressor equipment, plus construction emissions, including nitrogen oxides (NO_X) and carbon monoxide (CO), and the basis for these calculations. Summarize anticipated air quality impacts for the project. • Provide the emission rate of NO_X from existing and proposed facilities, expressed in pounds per hour and tons per year from maximum operating conditions, include supporting calculations, emissions factors, fuel consumption rate, and annual hours of operation.	§ 380.12(k)(3)	Section 9.3.2 Tables 9.3-4 to 9.3-6 and 9.3-9 And Appendix 9A
4. Describe the existing compressor units at each station where new, additional, or modified compressor units are proposed, including the manufacturer, model number, and horsepower of the compressor units. For proposed new, additional or modified compressor units include the horsepower, type and energy source.	§ 380.12(k)(4)	N/A
5. Identify any nearby noise-sensitive area by distance and direction from the proposed compressor unit building/enclosure.	§ 380.12(k)(4)	Section 9.4.3
6. Identify any applicable state or local noise regulations. • Specify how the facility will meet the regulations	§ 380.12(k)(4)	Section 9.4.2
7. Calculate the noise impact at noise-sensitive areas of the proposed compressor unit modifications or additions, specifying how the impact was calculated, including manufacturer's data and proposed noise control equipment.	§ 380.12(k)(4)	Section 9.4.4

Additional Information

Provide copies of application for state air permits and agency determinations, as appropriate	Copies of state air permits and agency determinations will be appended to the Maryland CFRA Application, a copy of which will be filed separately with the FERC in January 2007.
For Major Stationary Sources of air emissions (as defined by EPA), provide copies of applications for permits to construct (and operate, if applicable) or for applicability determinations under regulations for the prevention of significant air quality deterioration and subsequent determinations.	Copies of permits to construct and applicability determinations will be appended to the Maryland CFRA Application, a copy of which will be filed separately with the FERC in January 2007.
Describe measures and manufacturer's specifications for equipment proposed to mitigate impact to air and noise quality, including emissions control systems, installation of filters, mufflers, or insulation of piping and building, and orientation of equipment away from noise-sensitive areas.	Descriptions of measures to mitigate air quality impacts are provided in Section 9.3.6. Noise impact mitigation measures are described in Section 9.4.5.. AES will comply with local, state and Federal noise requirements. Specifications will be provided as they become available during the detailed design by the 2nd Quarter of 2008.

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Term	Description
"	inches
°F	degree Fahrenheit
bbl	barrels
bbl/h	barrels per hour
AMSC	Area Maritime Security Committee
ANSI	American National Standards Institute
AOR	Area of Responsibility
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ATWS	Additional Temporary Workspace
BIA	Bureau of Indian Affairs
BIBI	Benthetic index of biotic integrity
BMP	Best Management Practice
BMS	Burner Management System
BOG	boiloff gas
Bscfd / bscfd	billion standard cubic feet per day
Btu	British thermal unit
Btu/(ft^2hr)	British thermal unit per feet squared per hour
C5 plus	pentane plus
CCTV	closed circuit television
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
COE	U.S. Army Corps of Engineers
COMAR	Code of Maryland Regulations
COTP	Coast Guard Captains of the Port
CROW	Construction right-of-way
CWA	Clean Water Act
cy	cubic yard
CZMA	Coastal Zone Management Act of 1972
DB&B	double block and bleed
DCS	distributed control system
DMRF	Dredge Material Recycling Facility
Dth/day	Dekatherms per day
EA	Environmental Assessment
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EPC	Engineering, Procurement and Construction
ER	Environmental Report
ERC	emergency release coupling
ESA	Endangered Species Act of 1973

Term	Description
ESD	emergency shutdown
ESD-1	Pier Emergency Shutdown
ESD-1-1	Activation of the unloading arm/vapor return arm ERCs on Berth 1 and Berth 2
ESD-2	Total Terminal Emergency Shutdown
FAA	Federal Aviation Administration
FBE	Fusion-Bonded Epoxy
FEED	Front End Engineering Design
FERC	Federal Energy Regulatory Commission
FERC's Plan	FERC's Upland Erosion Control, Revegetation, and Maintenance Plan
FERC's Procedures	FERC's Wetland and Waterbody Construction and Mitigation Procedures
FM	Factory Mutual
fps	feet per second
ft	feet
gpm	gallons per minute
h	hour(s)
H&MB	heat and material balance
HAZID	Hazard Identification
HAZOP	Hazard And Operability
HDD	Horizontal Direction Drilling
HDMS	Hazard Detection and Mitigation System
HHV	higher heating value
HID	High Intensity Discharge
HIPPS	High Integrity Pipeline Protection System
Hp / hp	horsepower
HP	high pressure
HTF	heat transfer fluid
IESNA	Illuminating Engineering Society of North America
in	inch
inches H_2O	inches of water
inches Hg	inches of mercury
inches Hg/h	inches of mercury per hour
IP	intermediate pressure
ISO	International Organization for Standardization
Kts	knots
kV	kilovolt
kVA	kilovolt Ampere (one thousand Volt Amperes)
LDC	Local Distribution Company
LFL	lower flammability limit
LHV	lower heating value

Term	Description
LNG	Liquefied Natural Gas
LNG Terminal	Sparrows Point LNG Import Terminal
LOI	Letter of Intent
LP	low pressure
LTD	Level, Temperature, Density
M&R	Metering and Regulator
m^3	cubic meters
m^3/hour	cubic meters per hour
MAOP	Maximum Allowable Operating Pressure
mbar	millibar
mbar/hour	millibar per hour
MCC	Motor Control Center
mcf	million cubic feet
MCMERG	Mid-Chesapeake Marine Emergency Response Group
MCR	Main Control Room
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
Mg/l	Microgram per Liter
MIS	Management Information System
MLLW	mean low low water
MLV	Mainline valve
MMBtu/hr	million British thermal units per hour
MMcf/day	million cubic feet per day
MMscfd	million standard cubic feet per day
MP	Milepost
mph	miles per hour
MW	megawatt
N/A	not applicable
NAS Pax River	Naval Air Station Patuxent River
NAVD	North American Vertical Datum
NDE / NDT	Nondestructive Examination / Nondestructive Testing
NEC	National Electrical Code
NEPA	National Environmental policy Act of 1969
NFPA	National Fire Protection Association
NGA / NGPA	Natural Gas Act / Natural Gas Policy Act
NHPA	National Historic Preservation Act of 1969
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
No. ins	number of inches
NOAA	National Oceanic and Atmospheric Administration
NOx	nitrogen oxides

Term	Description
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise Sensitive Area
NWI	National Wetland Inventory
NVIC	Navigation and vessel Inspection Circular
O&M	Operations And Maintenance
OBE	Operating Basis Earthquake
OD	Outside Diameter
OSHA	Occupational Safety and Health Administration
P&ID	piping and instrumentation diagram
PAH	Poly Aromatic Hydrocarbon
PCB	Polychlorinated Biphyenyls
PCMS	Plant Control and Monitoring System
PCR	Platform Control Room
PDEP	Pennsylvania Department of Environmental Protection
PDM	Processed Dredged Material
PIANC	Permanent International Association Navigation Congress
PM	particulate matter
POTW	Publicly-owned Treatment Works
PPB / ppb	parts per billion
PPM / ppm	parts per million
PPT / ppt	Parts per trillion
psf	pounds per square foot
psig	pounds per square inch gauge
PWSA	Preliminary water way suitability assessment
PVC	Poly Vinyl Chloride
QA	Quality Assurance
QC	Quality Control
RGS	Rigid Galvanized Steel (conduit)
ROW	Right-of-Way
RR	Resource Report
RTD	resistance temperature detector
RTU	remote terminal unit
RUSLE	Revised Universal Soil Loss Equation
SAV	Aquatic vegetation
SCADA	Supervisory Control and Data Acquisition
scfh	standard cubic foot (feet) per hour
scfm	standard cubic foot (feet) per minute

Term	Description
SCUBA	Self-contained Underwater Breathing Apparatus
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SIS	Safety Instrumented System
SPCC	Spill Prevention, Control, and Countermeasure
SSE	Safe Shutdown Earthquake
SSURGO	Soil Survey Geographic
STATSCO	State Soil Geographic
SWPPP	Storm Water Pollution Prevention Plan
Tcf	Trillion Cubic Feet
TCP/IP	Transmission Control Protocol/Internet Protocol,
THPO	Tribal Historic Preservation Office
TMDL	Total Maximum Daily Load
TOC	Total organic carbon
Trap	Pig Launcher Receiver Facility
UL	Underwriters Laboratories
UPS	Uninterruptible Power Supply
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USDOE	United States Department of Energy
USDOT	United States Department of Transportation
USEPA / EPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
usg	United States gallons
usgpm	United States gallons per minute
V	voltage
VOC	volatile organic compound
WSA	Water way suitability assessment
WWTP	Waste Water Treatment Plant
§	Section

9.0 AIR AND NOISE QUALITY

9.1 Introduction

AES Sparrows Point LNG, LLC (Sparrows Point LNG) proposes to construct, own, and operate a new liquefied natural gas (LNG) import, storage, and regasification terminal (LNG Terminal) at the Sparrows Point Industrial Complex situated on the Sparrows Point peninsula east of the Port of Baltimore in Maryland. LNG will be delivered to the LNG Terminal via LNG marine traffic, offloaded from these ships to shoreside storage tanks, regasified on the LNG Terminal site (Terminal Site), and transported to consumers via pipeline. The LNG Terminal will have a regasification capacity of 1.5 billion standard cubic feet of natural gas per day (bscfd), with potential to expand to 2.25 bscfd. Regasified natural gas will be delivered to markets in the Mid-Atlantic Region and northern portions of the South Atlantic Region, through an approximately 88-mile, 30-inch outside diameter natural gas pipeline (Pipeline) to be constructed and operated by Mid-Atlantic Express, LLC (Mid-Atlantic Express). The Pipeline will extend from the LNG Terminal to interconnections with existing natural gas pipeline systems near Eagle, Pennsylvania. Together, the LNG Terminal and Pipeline projects are referred to as the Sparrows Point Project or Project. Both Sparrows Point LNG and Mid-Atlantic Express (hereinafter collectively referred to as AES) are subsidiaries of The AES Corporation.

The Project footprint is located in the counties of Baltimore, Harford and Cecil in Maryland, and in the counties of Lancaster and Chester in Pennsylvania. The Terminal Site, which is located entirely within Baltimore County, is a parcel located within a former shipyard. The route proposed for the Pipeline (Pipeline Route), which crosses all of the listed counties, includes industrial, commercial, agricultural, and residential lands. Together, the Terminal Site and the Pipeline Route comprise the Project Area.

As described in Section 1.10 of Resource Report 1, *General Project Description*, The AES Corporation is considering the possibility of building a combined cycle cogeneration power plant (Power Plant) on the Terminal Site. The Power Plant would be configured with one F-Class combustion gas turbine, one steam turbine, and associated auxiliaries. It would operate only on natural gas and would produce approximately 300 megawatts (MW) of clean electric power within an area of high energy demand. The Power Plant would be connected to the local utility electric system via an overhead transmission line.

9.2 Objective and Applicability

This Resource Report discusses the existing air and noise quality within the vicinity of both the LNG Terminal and the Pipeline, the potential impacts to air and noise quality associated with construction and operation of the Project and the Power Plant, and the proposed measures to avoid or minimize those impacts. For the purpose of this Resource Report, Project Area also refers to all temporary and permanent construction work spaces, including the construction rights-of-way, storage yards, staging areas, dredging areas, and any additional work spaces that are required to construct the Project.

With respect to the General Conformity Rule (Title I, Section 176(c) of the Clean Air Act (CAA), codified in 40 CFR Part 51, Subpart W and 40 CFR Part 93, Subpart B), the portions of the Project considered Federal Actions are the Pipeline (subject to Federal Energy Regulatory Commission (FERC) Section 7 Certificate of Public Convenience and Necessity), the LNG Terminal (subject to a FERC Section 3 authorization), and dredging activities associated with the LNG Terminal (subject to a U.S. Army Corps of Engineers (COE) permits pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act). However, as further discussed in Section 9.3.3, the portions of the LNG Terminal and the Power Plant (if constructed) that will be subject to New Source Review permitting under the CAA (i.e., the hot water heaters, emergency engines, combustion turbines, and vent heater) are not subject to the General Conformity Review process. Therefore, only direct and indirect emissions from construction and operation of the Pipeline, construction of the LNG Terminal, and vessel activity and indirect emissions during operation of the LNG Terminal are subject to General Conformity Review.

9.3 Air Quality

9.3.1 Existing Air Quality

9.3.1.1 Climate/Meteorology

The Chesapeake Bay, Delaware Bay and the Atlantic Ocean farther to the east generally give mild winters and summers to the portion of the Project Area encompassing the LNG Terminal and much of the Pipeline. Although some of the Pipeline is located further inland and would be less moderated by the effects of the Chesapeake and Delaware Bays, climatologically statistics for Baltimore are considered generally representative of the climate of the entire Project Area.

According to the National Oceanic and Atmospheric Administration (NOAA), typical January daily temperatures range from a minimum of 23.4 degrees Fahrenheit (°F) to a maximum of 40.2°F for the Project Area. July temperatures typically range from a minimum of 66.8°F to a maximum of 87.2°F. The record minimum and maximum temperatures are -7°F and 105°F, respectively. Typical morning relative humidity ranges from a low of about 70 percent in the winter to a high of about 85 percent in the early fall. Afternoon relative humidity is generally about 55 percent. The annual average precipitation is about 41 inches and is evenly distributed throughout the year. About one-third of the days have precipitation totaling 0.01 inches or more. Winter precipitation is generally associated with sub-mesoscale weather systems. The average snowfall is about 20 inches per year. Summer precipitation tends to be associated with thunderstorms. During the summer, the region is generally under the influence of the Bermuda high-pressure system. High-pressure systems are typically associated with low winds and increased potential for air quality problems.

The prevailing wind direction is generally from the west northwest in the Baltimore area. A southwest component becomes evident in winds during the warmer months while a northwest component is characteristic of the colder months. Figure 9.3-1 is a wind rose plot that represents wind direction and wind speed data compiled by the Baltimore-Washington International Airport for 1992, the most recent year for which a dataset is readily available (U.S. Environmental Protection Agency (EPA) SCRAM Surface Archived Data (TD-1440)).

9.3.1.2 Ambient Air Quality Standards

EPA has established primary and secondary national ambient air quality standards for certain air pollutant emissions, including carbon monoxide (CO), lead, nitrogen dioxide (NO_2), ozone, particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$) and sulfur dioxide (SO_2), which are referred to under the CAA as "criteria pollutants." National Ambient Air Quality Standards (NAAQS) have been established for each of the criteria pollutants. Standards are designated as primary or secondary. Primary standards are set at levels designed to protect public health. Secondary standards are set to protect welfare values such as vegetation, visibility and property values. States are free to adopt standards more stringent than the NAAQS. Maryland and Pennsylvania have adopted all of the NAAQS. Table 9.3-1 summarizes the NAAQS as well as the corresponding Maryland and Pennsylvania Ambient Air Quality Standards.

9.3.1.3 Ambient Air Quality Attainment Status

The LNG Terminal is proposed to be located in Baltimore County, Maryland. The Pipeline Route is proposed to be located within portions of the Maryland counties of Baltimore, Harford and Cecil and the Pennsylvania counties of Lancaster and Chester. Baltimore County and Harford County are contained in the Metropolitan Baltimore Intrastate Air Quality Control Region (AQCR 115). Cecil County is contained in the Eastern Shore Intrastate AQCR (114). Lancaster County and Chester County are located in two different AQCRs, the South Central Pennsylvania Intrastate AQCR (196) and the Metropolitan Philadelphia Interstate AQCR (045), respectively. The EPA has designated all four of these AQCRs as being either in attainment with the NAAQS or unclassifiable/attainment for certain criteria air pollutants, including SO_2, CO, and NO_2. With respect to the one-hour ozone (O_3) standard (revoked as of June 25, 2005), the Metropolitan Baltimore, Eastern Shore AQCR and the Metropolitan Philadelphia AQCR are classified as severe-15 non-attainment, whereas the South Central Pennsylvania AQCR is classified as marginal non-attainment. With respect to the new 8-hour ozone

standard, both of the Maryland AQCRs and the Metropolitan Philadelphia AQCR are classified as moderate non-attainment. The South Central Pennsylvania AQCR is classified as marginal non-attainment for the new 8-hour ozone standard. All four Project Area AQCRs have either not been classified or are unclassifiable/attainment for particulate matter less than 10 micrometers (PM_{10}) and lead (Pb). For $PM_{2.5}$, all of the Project Area AQCRs have been classified as non-attainment, with the exception of the Eastern Shore AQCR, which is unclassifiable/attainment.[1] For Total Suspended Particulate (TSP), portions of the Metropolitan Baltimore AQCR that potentially include part of the Pipeline route have been classified as nonattainment. Although portions of both Project-affected AQCRs in Pennsylvania have been classified as not meeting secondary standards or cannot be classified, the Pipeline will not pass through those portions of the PA AQCRs. The Eastern Shore AQCR in Maryland has been classified as better than national standards with respect to TSP. Although TSP attainment designations are listed in 40 CFR 81, there no longer are TSP NAAQS and TSP-directed State Implementation Plan (SIP) programs. EPA revised the primary and secondary NAAQS for particulate matter on July 1, 1987 by eliminating TSP as the indicator for the NAAQS and replacing it with the PM_{10} indicator. Table 9.3-2 summarizes the attainment status for each of the AQCRs included in the Project Area.

Because each of the Project Area AQCRs is classified as non-attainment with respect to the old one-hour ozone standard and had 1-hour design values greater than or equal to 0.121 ppm, they are categorized as "subpart 2" non-attainment with respect to the new 8-hour ozone standard. As such, each of the AQCRs is subject to specific requirements that must be incorporated into State Implementation Plans (SIP) for attaining the national ozone air quality standards. In addition, Maryland and Pennsylvania are considered part of the Ozone Transport Region (OTR). The OTR encompasses eleven northeast states and the District of Columbia, all of which have at least some areas not meeting the NAAQS for ozone. Because ozone attainment is a region-wide problem involving interstate transport of ozone precursors, projects locating in all areas within the OTR must meet more stringent non-attainment new source review requirements. The applicable emissions thresholds triggering major new source review in the Metropolitan Baltimore Intrastate AQCR are 25 tons per year (TPY) for either volatile organic compounds (VOC) or nitrogen oxides (NO_X). New stationary sources with the potential to emit VOC or NO_X above these thresholds would be classified as Major Stationary Sources subject to more stringent Non-attainment New Source Review (NNSR) requirements.

9.3.1.4 Existing Ambient Air Quality Monitoring Data

Maryland Department of the Environment (MDE) and Pennsylvania Department of Environmental Protection (PDEP) monitor ambient concentrations of certain criteria pollutants at a number of monitoring stations located in the Project Area AQCRs. The monitored data, which are available from EPA's AirData website (http://www.epa.gov/air/data/reports.html), were evaluated to determine representative air quality levels for the Project Area. Monitoring stations with closest proximity to the Project Area are located in Baltimore County, Harford County, and Cecil County in Maryland and in Lancaster, Chester, Delaware and Montgomery Counties in Pennsylvania. Table 9.3-3 summarizes the most recent three-year averages of the data available from monitoring stations with the most representative locations within the Project Area. The assumptions used in developing the most representative three-year average concentrations are also detailed in Table 9.3-3. The monitoring data demonstrates that all monitored pollutants are meeting the NAAQS, with the exception of one-hour and 8-hour average ozone concentrations in all four Project Area AQCRs and annual average PM-2.5 concentrations in Baltimore County in Maryland and Chester and Lancaster Counties in Pennsylvania.

9.3.2 Estimated Emissions from the Project

Air pollutant emissions will result from construction of the proposed Pipeline facilities, and from construction and operation of the proposed LNG Terminal and nonjurisdictional facilities related to the LNG Terminal (Power Plant). Emissions due to construction activities associated with the Pipeline and LNG Terminal would result in temporary increases in fugitive dust (PM_{10} and $PM_{2.5}$) from disturbed soils, as well as criteria pollutants (CO, NO_X, SO_2, PM_{10}, $PM_{2.5}$ and VOCs) and some hazardous air

[1] Effective December 18, 2006, EPA revised the 24-hour $PM_{2.5}$ NAAQS from 65 to 35 $\mu g/m^3$ and revoked the 24-hour PM_{10} NAAQS. Therefore, revised nonattainment designations are pending based on review of monitored $PM_{2.5}$ 24-hour ambient data in comparison to the revised NAAQS.

pollutants (HAPs) from diesel and gasoline powered construction equipment. Because EPA estimates that $PM_{2.5}$ comprises 97 percent of particulate matter from diesel and gasoline powered construction equipment and mobile sources, $PM_{2.5}$, PM_{10} and TSP are assumed to be equivalent for regulatory applicability determination purposes. The same conservative assumption was used to estimate $PM_{2.5}$ emissions from combustion sources proposed for the operational phase of the LNG Terminal and Power Plant, based on similar EPA estimates ($PM_{2.5}$ typically comprises greater than 90 percent of combustion source PM_{10} and TSP emissions). In addition, ammonia emissions have been estimated for construction and operational phase equipment based on available emission factors as a $PM_{2.5}$ precursor, in order to address the potential that future SIP revisions to establish control measures in $PM_{2.5}$ nonattainment areas may require use of precursor ammonia emissions for New Source Review and General Conformity determinations.

Additional construction-related emissions would result from dredging activities needed to expand the ship approach channel and turning basin to support proposed marine terminal operations at the LNG Terminal. Should the nonjurisdictional Power Plant be built, additional emissions would result from construction activities during the construction period for that facility. These additional construction emissions are addressed separately in this section. Fugitive dust and other emissions from construction activities generally do not contribute significantly to increases in regional pollutant levels. However, the short-term effects of construction emissions will be addressed in the General Conformity Analysis, if applicable (see Section 9.3.3.10), to ensure compliance with the respective SIPs in Maryland, Pennsylvania, and Virginia.

There will be no significant emissions resulting from the operation of the proposed Pipeline because no compression facilities will be installed. Emissions from operation of the LNG Terminal would primarily involve criteria pollutants and HAPs from operation of the High Temperature Fluid (HTF) heating system used to provide heat to the LNG vaporizers and from LNG ship auxiliary power systems used during offloading of LNG to the Terminal. Emissions will also result from operation of emergency diesel engine powered fire water pumps, a diesel engine powered standby electricity generator and other minor auxiliary combustion equipment. Maintenance dredging activities would result in periodic emissions, typically occurring over an approximately one-month period at three-year intervals during the operational phase of the Project. Additional emissions would result from operation of the nonjurisdictional Power Plant, which would include an approximately 300-MW combined cycle cogeneration power plant at the Terminal Site.[2] Descriptions of construction activities and operational phase stationary sources associated with each Project component are provided below along with summaries of estimated emissions. Mobile source emissions associated with marine vessels used during the LNG Terminal operation, including LNG ship movements and hoteling, assist tug boats and U.S. Coast Guard (USCG) escort and patrol boats, are also estimated and discussed under LNG Terminal operations. Assumptions and detailed emissions calculations are provided in Appendix 9A.

Emissions from construction and operation of the LNG Terminal, dredging activities and Power Plant (if constructed) will occur entirely in Maryland. Emissions from construction of the Pipeline will occur both in Maryland and Pennsylvania. The distribution between Pipeline construction emissions in Maryland and Pennsylvania is discussed in Section 9.3.2.1. The potential for emissions from operation of the LNG Terminal and Power Plant to result in ambient air quality impacts in Maryland and certain downwind states is evaluated in Section 9.3.5.

9.3.2.1 Pipeline

A. Construction Emissions

The use of equipment to construct the Pipeline will result in temporary, short-term emissions of certain air pollutants. These emissions will be restricted to the construction period for the Pipeline and will terminate once construction has been completed. Fugitive dust emissions also may occur during construction, post-construction mitigation and maintenance activities. These emissions will not result in significant adverse impacts to the air quality within the vicinity of the Project Area, and AES will not be required to obtain any federal, state, or local authorizations for the temporary, short-term air

[2] As described in Sections 9.3.2.2 and 9.3.2.4, if AES decides to construct and operate the Power Plant both to provide heat to the LNG vaporizers and generate electricity for the local utility electric system, the combined cycle Power Plant would operate in lieu of or in conjunction with the hot water heaters, depending on the operating scenario.

pollutant emissions that will be associated with construction of the Project. Fugitive dust control measures, if required, will be implemented during construction and operation of the Pipeline and are discussed in Section 9.3.6.

During construction of the Pipeline, the use of internal combustion engines in trucks, dozers, trenchers, cranes, generators, compressors, drilling rigs, pumps, other miscellaneous heavy construction equipment, and worker commuting vehicles will result in emissions of NO_X, SO_2, CO, PM_{10}, $PM_{2.5}$, VOC and HAPs. These emissions will not be concentrated within any particular location of the Project Area. The duration of the main construction period for the Pipeline will be about 10 to 12 months; therefore, the period during which air pollutant emissions will occur in any particular location of the Project Area will be substantially less than the total construction period. For example, AES anticipates that Pipeline construction will progress at a rate of approximately six to eight weeks per mile (from clearing through final restoration). From a receptor basis, exposure to emissions from Pipeline construction activities would occur at any one location for only the limited period during which construction is active in the vicinity of the receptor.

Fugitive dust emissions from activities such as grading, trenching, backfilling, and vehicle traffic, will occur during construction periods. Prior to revegetation of disturbed soil areas within the Project Area, wind erosion of displaced soil may also generate fugitive dust emissions. AES will use the mitigation measures identified in Section 9.3.6 of this Resource Report to minimize the fugitive dust emissions associated with construction of the Pipeline. These measures may include the application of water or dust suppressants, covering of haul trucks, use of paved roads to the extent possible, limiting vehicle speed and stabilizing disturbed areas.

AES has estimated the actual emissions of criteria air pollutants that will be associated with construction of the Pipeline based on the assumptions and detailed calculations provided in Appendix 9A of this Resource Report. AES's assumptions concerning the types, numbers and operating schedules for the various construction equipment and activities are based on information provided by potential construction contractors for the Pipeline. Construction equipment will typically include various combinations of cranes, backhoes, dozers, trenching machines, graders and similar equipment. As required, horizontal drilling rigs will also be used for installation of the Pipeline at certain river and stream crossings. Emissions were estimated based on the typical maximum number of major equipment types that may be in operation at any one time. For the purpose of this analysis, all equipment was assumed to be powered by diesel compression ignition (CI) engines, as is typical for this type of equipment. Use of low-sulfur diesel oil with a sulfur content of 0.05 weight percent (500 ppm) was assumed, due to the fact that construction would begin after the effective date (June 2007) for EPA's nonroad engine diesel fuel sulfur standards applicable to all land-based nonroad, locomotive and marine engine diesel fuel. Emission factors (grams of pollutant per brake horsepower-hour) were derived using EPA procedures in "Exhaust Emission Factors for Nonroad Engine Modeling–Compression Ignition" (June 15, 1998 and revised April 2004), which also is the basis for EPA's "NONROAD Emissions Inventory Model" (draft June 8, 2000). Emission factors were multiplied by typical in-use adjustment factors, also based on EPA's non-road model, and by the estimated horsepower ("HP") for each type of equipment that will be used to construct the Pipeline.

AES has calculated conservatively high estimates of the actual emissions that will be associated with construction of the Pipeline. The emissions estimates were calculated using emissions factors that are based on 1988-1996 model year engines. Engines for those years are anticipated to have higher actual emissions than current model year engines because the older engines are not subject to Tier 1, 2 or 3 emissions standards.[3]

Indirect emissions were also estimated from motor vehicles associated with workers commuting to and from the construction locations of the Pipeline. Some commuting will also occur from inspection and maintenance crews traveling to and from the Project Area during the Project's operational phase, but will be significantly less than during the construction phase. Emissions were conservatively estimated based on the assumptions and calculations presented in Appendix 9A. A total of 80 workers conservatively were assumed to commute to the Pipeline construction sites (two pipeline construction

[3] The first Federal standards (Tier 1) for off-road diesel engines were adopted in 1994 for engines over 50 hp, to be phased in from 1996 to 2000. Tier 2/Tier 3 standards were adopted in 1998, with phase-in of increasingly more stringent standards between 2000 and 2008.

spreads) each day for a total of 180 days. Emission factors were obtained from EPA AP-42, Appendix J (1998) for light duty gasoline vehicles and trucks.

Table 9.3-4 summarizes the estimated emissions from construction equipment including indirect emissions from material hauling trucks and commuting construction workers. Emissions are summarized in total tons during each year of the construction period by AQCR in the Maryland and Pennsylvania portions of the Pipeline, by state, and for the entire Pipeline construction project. As is typical of emissions from diesel engines, actual emissions rates for pollutants SO_2, PM_{10}, $PM_{2.5}$ and VOC are significantly lower than NO_2 and CO emissions.

Based on this analysis, direct emissions from construction equipment, indirect emissions from commuting construction workers and fugitive dust emissions are not expected to significantly affect ambient air quality in the Project Area. These emissions and impacts will be restricted to the construction period, approximately 12 months, for the Pipeline, and will terminate once construction has been completed. In addition, the emissions will not be concentrated for any extended period within any particular location along the Pipeline Route.

B. Operational Emissions

The operation of the Pipeline also will not result in any adverse impacts to local ambient air quality, and AES will not be required to obtain any federal, state, or local air quality authorizations for the operation of the Pipeline. As previously stated, the Pipeline will not involve the construction of new or modification of existing stationary sources of air pollutant emissions in Maryland or Pennsylvania, such as a compressor station. Limited fugitive dust emissions may occur during periodic inspection or maintenance of the pipeline, particularly where maintenance vehicles will travel on unpaved access roads. However, these fugitive dust emissions will be minimal and will not have an adverse impact on the local ambient air quality.

9.3.2.2 LNG Terminal

A. Construction Emissions

The use of equipment to construct the LNG Terminal will result in temporary, short-term emissions of air pollutants that will be restricted to the construction period for the LNG Terminal and will terminate once construction has been completed. These emissions will not result in significant adverse impacts to the air quality within the vicinity of the Project Area, and AES will not be required to obtain any federal, state, or local authorizations for the temporary, short-term air pollutant emissions that will be associated with construction of the LNG Terminal. Fugitive dust control measures, if required to be implemented, are discussed in Section 9.3.6.

LNG Terminal construction activities can generally be categorized into demolition, site preparation, terminal process construction, LNG tank construction, and marine pier rehabilitation activities. Dredging and reclamation activities associated with expansion of the LNG ship approach channel and turning basin are also associated with LNG Terminal construction, but are described separately in Section 9.3.2.3. During construction activities associated with the LNG Terminal, the use of internal combustion engines in various cranes, backhoes, dozers, loaders, pavers, trucks, welders, generators, air compressors, pumps, pile drivers, other miscellaneous heavy construction equipment, and worker commuting vehicles will result in emissions of NO_X, SO_2, CO, PM_{10}, $PM_{2.5}$, VOC and HAPs. The duration of the main construction period for the LNG Terminal will be about 32 to 36 months.

Fugitive dust emissions from activities such as demolition, site preparation, grading and vehicle traffic, will occur during construction periods. Prior to paving or revegetation of disturbed soil areas within the Project Area, wind erosion of displaced soil may also generate fugitive dust emissions. AES will use the mitigation measures identified in Section 9.3.6 of this Resource Report to minimize the fugitive dust emissions associated with construction of the LNG Terminal. These measures may include the application of water or dust suppressants, covering of haul trucks, use of paved roads to the extent possible, limiting vehicle speed and stabilizing disturbed areas.

AES has estimated the actual emissions of criteria air pollutants and HAPs that will be associated with construction of the LNG Terminal based on the assumptions and detailed calculations provided in Appendix 9A of this Resource Report and as summarized in Section 9.3.2.1. AES's assumptions concerning the types, numbers and operating schedules for the various construction equipment and activities are based on information provided by construction contractors being considered for the Project.

Indirect emissions were also estimated from motor vehicles associated with workers commuting to and from the LNG Terminal construction site. Emissions were conservatively estimated based on the assumptions and calculations presented in Appendix 9A. A total of 200 workers were assumed to commute to the LNG Terminal construction site by light duty gasoline vehicles each day for a total of 32 months. Four school buses were also assumed to transport workers from a parking area located within 1.5 miles from the site for a duration of 36 months. Emission factors were obtained from EPA AP-42, Appendix J (1998) for light duty gasoline vehicles and trucks.

Table 9.3-4 summarizes the estimated emissions from construction equipment including indirect emissions from commuting construction workers associated with LNG Terminal construction. Emissions are summarized in total tons during each year of the construction period. All emissions will occur in Baltimore County in AQCR 115.

Based on this analysis, direct emissions from construction equipment, indirect emissions from commuting construction workers, and fugitive dust emissions are not expected to significantly affect ambient air quality in the Project Area. These emissions and impacts will be restricted to the construction period for the LNG Terminal, approximately 36-months, and will terminate once construction has been completed.

B. Operational Emissions

As discussed in Section 9.3.2, operation of the LNG Terminal will involve the use of a HTF heating system to provide heat to the LNG vaporizers. The HTF heating system will consist of four installed natural gas-fired hot water heaters. Under normal operation, three hot water heaters will be operating and one will be placed in hot standby condition using a heating coil. The hot water heaters will typically be rotated once per week to obtain even run time for each heater throughout the year. If AES decides to construct and operate the Power Plant both to provide heat to the LNG vaporizers and generate electricity for the local utility electric system, the combined cycle Power Plant would operate in lieu of or in conjunction with the hot water heaters, depending on the operating scenario. Operational emissions associated with the nonjurisdictional Power Plant are addressed separately in Section 9.3.2.4. Another minor source of PM_{10} and $PM_{2.5}$ emissions only associated with the Power Plant is a cooling tower that would run when there is insufficient LNG gas flow (sendout) to provide cooling for the Power Plant Rankine cycle and the decision is made to nonetheless operate the Power Plant. Such operation would be intermittent.

Based on the results of preliminary engineering design, four hot water heaters are proposed for installation at the LNG Terminal to provide heat required for LNG vaporization as part of the HTF heating system. Three of the hot water heaters would normally be operated for the equivalent of up to 8,760 hours per year at up to 100 percent rated capacity with the fourth hot water heater operated in hot standby using a heating coil. Each hot water heater would be rated at 345 million British thermal units per hour (MMBtu/hr) maximum heat input and will be fueled exclusively with natural gas. It was assumed that there would be two catalyst malfunctions per hot water heater per year, lasting 48 hours each, resulting in uncontrolled emissions. Furthermore, it was assumed that each hot water heater would undergo three cold iron startups per year, each lasting one hour at an average of 15 percent load before controls were effective. This was the operating scenario used as a basis for the estimated short-term and annual potential emissions. Table 9.3-5 summarizes maximum emission rates for the hot water heaters based on these assumptions. Criteria pollutant emissions factors were based on a review of recent Best Available Control Technology (BACT) and Lowest Achievable Emission Rate (LAER) determinations for similar types and sizes of natural gas-fired hot water heaters, and from preliminary emissions guarantees from potential vendors. The emissions control systems would include low-NO_X burners and/or flue gas recirculation for preliminary NO_X control, selective catalytic reduction (SCR) for final NO_X control, and oxidation catalysts for CO control.

Minor and intermittent emission sources at the LNG Terminal, which will only operate in the event of an emergency or electrical power interruption, include several small diesel reciprocating engines used for emergency fire water pumping and standby electricity generation. Based on preliminary engineering, one 375 HP diesel engine driven freshwater fire water pump and six 700 HP diesel engine driven salt water fire water pumps are specified. In addition, one 2,000 kW diesel engine driven emergency generator set is specified, capable of providing 100 percent standby power to maintain LNG circulation via operation of one low pressure (LP) pump, terminal lighting, and all control systems, and provide for the operation of all other necessary auxiliary systems. The assumed worst-case operating scenario for these emergency standby engines is 60 hr/yr per engine to conduct periodic testing and to allow for an emergency event. Emissions were estimated based on engine manufacturer performance and emissions data provided by Caterpillar, Inc. for criteria pollutants other than SO_2, and on EPA AP-42 emission factors for SO_2 and hazardous air pollutants (see Appendix 9A). Short term and annual emissions rates for the diesel engines are summarized in Table 9.3-5.

In addition to the hot water heaters, fire water pumps and emergency standby generator, a heated vent stack will be installed at the LNG Terminal, which will only be used to heat boil off vapors from the LNG Terminal if a power failure renders the vapor handling systems inoperable. The heated vent stack will be a small (5.5 MMBtu/hr) natural gas-fired combustion source and is assumed to operate no more than 50 hours per year. Emissions from the heated vent stack were estimated based on vendor emission factors (see Appendix 9A) and are summarized in Table 9.3-5.

Emissions from each of the LNG Terminal sources are summarized in Table 9.3-5 in comparison to major stationary source thresholds. For the purposes of the major stationary source applicability determination, as further discussed in Section 9.3.3.1, total potential emissions associated with operation of the LNG Terminal include the combination of emissions from stationary sources at the LNG Terminal with emissions from LNG ships associated solely with LNG offloading activities while the LNG ships are at berth. Assumptions used in estimating emissions from LNG ships during offloading activities are further described in Section 9.3.2.2.C. This analysis demonstrates that potential emissions will be less than EPA major stationary source thresholds for each regulated pollutant, with the exception of ozone precursor NO_X emissions. Therefore, as discussed in Section 9.3.3.1, the LNG Terminal will be a major source with respect to NO_X emissions in an ozone nonattainment area, and will be subject to NNSR permitting requirements. The LNG Terminal will be considered a minor source with respect to VOC and all attainment pollutants and, therefore, will not be subject to NNSR for VOC or Prevention of Significant Deterioration (PSD) review for any attainment pollutants.

As discussed in Section 9.3.3.1, AES will seek MDE permits for construction of the emission sources and for NNSR approvals, as applicable, to obtain enforceable limitations on potential emissions. AES will seek permit limits on the number of operating hours and annual diesel consumption for the emergency fire pumps and standby generator. AES will also seek enforceable permit limitations to construct and/or the NNSR approval for the hot water heaters to limit annual operations and emissions from LNG ship offloading activities. AES will work with MDE during the permitting process to develop permit conditions that will be practically enforceable with LNG shippers.

C. Marine Vessel Emissions

Marine vessels used during LNG Terminal operation include LNG ships, assist tugboats, security boats and USCG escort boats. For the purposes of conservatively estimating marine vessel emissions, the estimated annual emissions from these mobile sources are based on up to 180 LNG ship arrivals of various capacity ships; three tug boats, and two security or escort boats participating in the arrival, berthing and departure of each LNG ship; and emissions during LNG offloading and idling while stationary at berth (hoteling). AES estimates that LNG ships will arrive at the Terminal Site with a typical frequency of two to three ships per week depending on the capacity of the ship). Each ship will remain stationary at the berth for a maximum of 24 hours, about 12 to 18 hours of which will involve LNG transfer, depending on the capacity of the ship and an average unloading rate of about 11,500 cubic meters per hour.

As discussed in Sections 9.3.2.2.B and 9.3.3.1, emissions from LNG ship offloading operations have been combined with potential emissions from stationary sources at the LNG Terminal for purposes of

determining PSD and NNSR permit applicability. Therefore, emissions from LNG offloading operations were calculated separately from all other LNG ship and associated marine vessel activity.

AES obtained information concerning the type of propulsion, power generation, fuel types, operating scenarios and other parameters necessary to estimate emissions during transit in Virginia and Maryland state waters, and during berthing, hoteling and unloading activities at the LNG Terminal. Based on this information, the current fleet of LNG ships (182 within AES's design range of 125,000 to 217,000 cubic meter capacity) exclusively run on conventional steam-electric power plants for both propulsion and auxiliary power and are fueled with boil-off gas or of heavy fuel oil. AES has also determined that there are currently 117 LNG ships on order or under construction within AES's design capacity envelope for the LNG Terminal. These consist of 61 (52 percent) steam powered ships and 57 (48 percent) ships that are powered by slow speed or medium speed diesel engines for propulsion and auxiliary power. The diesel engines can be fueled with low sulfur distillate (1.5 percent sulfur), heavy fuel oil (2.7 percent sulfur) or dual fuel mixtures (e.g., Marine Gas Oil (MGO,) typically consisting of 90 to 95 percent natural gas and 5 to 10 percent low sulfur oil). Because AES will not own or operate the LNG ships that will deliver LNG to the LNG Terminal, a number of different power plant and fuel scenarios were evaluated in order to conservatively estimate the range of emissions to be expected from LNG ship movements and transfer operations. The scenarios evaluated ranged from natural gas fired steam-electric power plants to diesel engines firing 2.7 percent sulfur heavy fuel oil. An assumed mix of technologies and fuels was then used to estimate annual emissions, based on AES's evaluation of the representative levels of technologies and fuels currently in use and projected to be in use in the LNG shipping industry. Different sets of assumptions were also used to estimate emissions from LNG offloading and hoteling operations at the LNG Terminal and for LNG ships transiting in state waters. Detailed assumptions used for all calculations are summarized in Appendix 9A. AES believes these are conservative assumptions; however, the assumptions may need to be refined in the future based on actual shipping assignments and/or availability, actual ship operating conditions, and trends in the industry for the various sizes of LNG ships.[4]

It should be noted that EPA's nonroad engine diesel fuel sulfur standards were not factored into this analysis for the LNG tanker ships because the standards are not applicable to non-U.S. flagged ocean going vessels. However, EPA's nonroad engine diesel fuel sulfur standards were factored into the analysis of emissions from assist tug boats, as these are U.S. flagged vessels that are subject to the EPA nonroad engine diesel fuel sulfur standards. The applicable limits for marine diesel engines are 500 ppm sulfur (0.05 percent) beginning June 1, 2007, and 15 ppm sulfur (0.0015 percent) beginning June 1, 2012.

The emission estimates based on the current assumptions and EPA emission factors are presented in Appendix 9A, and the results are summarized in Table 9.3-5. As discussed above, emissions from LNG ship unloading operations are summed with LNG Terminal stationary sources for the major source applicability determination. Estimates of annual emissions from all marine vessel movements associated with LNG ship arrival, berthing, and departure are separately summarized in Table 9.3-5, including a breakdown by state for LNG ship and associated marine vessel movements in Maryland and Virginia state waters for determining General Conformity applicability.

9.3.2.3 Dredging and Reclamation

A. Construction Emissions

The LNG Terminal construction includes widening and deepening the existing approach channel and turning basin at Sparrows Point to accommodate the LNG ships. Dredging related construction activities include both onshore and offshore equipment and processing. Onshore activities include start-up and dredged material transfer and processing operations, involving typical construction equipment, such as cranes, backhoes, excavators, loaders, trucks and sweepers. Internal combustion engines used to power this equipment will result in temporary emissions of NO_X, SO_2, CO, PM_{10} and VOC. A dredged material recycling facility (DMRF), as described in Section 1.5.1.2.A of Resource

[4] AES will attempt to negotiate LNG terminalling contracts under which tankers will operate preferably with natural gas and alternately with low sulfur marine diesel while stationary at the LNG Terminal, in order to minimize emissions and air quality impacts. At this time, AES cannot predict the success it will have in negotiating such contracts. Accordingly, the conservative assumptions outlined above and in more detail in Appendix 9A are even more appropriate at this time.

Report 1, *General Project Description*, will also be constructed and operated at the construction site, involving use of hoppers, conveyors, pug mills for mixing additives, and stacking equipment. Pug mills and the additive delivery system will be equipped with separate baghouse dust collectors to control PM_{10} and $PM_{2.5}$ emissions. Marine vessels and equipment used for offshore dredging activities will include a clamshell dredge or suitable alternative required by permit, in addition to tug boats, survey/work boats, crew boats and inspecting/diving vessels. Diesel engines used to power these vessels and the dredge will result in temporary emissions of NO_X, SO_2, CO, PM_{10} and VOC. Indirect emissions will also result from transfer of the processed dredged (PDM) offsite with dump trucks and from workers commuting to the Terminal Site. The duration of the dredging activities at the LNG Terminal has been estimated at about two years.

AES will use the mitigation measures identified in Section 9.3.6 and Appendix 9D, Fugitive Dust Suppression and Monitoring Plan, of this Resource Report to minimize the fugitive dust emissions associated with transfer of the PDM once it has been processed in the DMRF. These measures may include the application of water or dust suppressants, covering of haul trucks, use of paved roads to the extent possible, limiting vehicle speed and stabilizing disturbed areas.

AES has estimated the actual emissions of criteria air pollutants associated with dredging related activities at the LNG Terminal based on the assumptions and calculations provided in Appendix 9A of this Resource Report and as summarized in Section 9.3.2.1. AES's assumptions concerning the types, numbers and operating schedules for the various construction equipment, marine vessels and activities are based on information provided by construction contractors being considered for the Project.

Indirect emissions were also estimated from motor vehicles associated with workers commuting to and from the LNG Terminal construction site associated with dredging activities and from haul trucks and additive supply trucks. Emissions were conservatively estimated based on the assumptions and calculations presented in Appendix 9A. A total of 15 workers were assumed to commute to the LNG Terminal construction site by light duty gasoline vehicles each day for a total of 24 months. A total of 218 haul trucks and 27 additive supply trucks per day were assumed for 276 days per year during the two-year dredging duration. Emission factors were obtained from EPA AP-42, Appendix J (1998) for light duty gasoline vehicles and trucks and heavy duty diesel haul and supply trucks.

Table 9.3-4 summarizes the estimated emissions from construction equipment, marine vessels, and material processing and indirect emissions from PDM hauling and commuting construction workers associated with dredging activities. Emissions are summarized in total tons during the construction period. The estimated actual emissions of NO_2 and CO from the use of diesel CI engines in dredging related equipment over the construction period are 268 and 83 tons, respectively. As is typical of emissions from diesel engines, actual emissions rates for other pollutants (SO_2, PM_{10} and VOC) are significantly lower than NO_2 and CO emissions.

To assess qualitatively the potential for odors and inhalation of dredged sediments due to dredging and processing of the sediments, AES obtained information from Clean Earth Dredging Technologies Inc. (CEDTI), with whom AES is considering contracting for the dredging work associated with the LNG Terminal. In CEDTI's experience, the dredged material may appear (visually) to have a high organic content. However, typical Total Organic Carbon results are around three to five percent. Further, the odor of raw dredged material is minimal and not pervasive. At the dredging site, the processing site and the storage/end use sites there will be very little odor. The potential for ammonia odors exists at the DMRF due to the addition of alkaline materials into the dredged sediments, but this odor will dissipate rapidly and only be noticeable within feet of the processed material. For example, CEDTI operates its Jersey City, New Jersey processing facility within 1,000 feet of high-end condominiums near Manhattan and has never received a complaint or even a comment from neighbors or local regulators. Likewise, no complaints have been made at any of CEDTI's end use sites. CEDTI does not employ any odor suppression techniques at any of its current facilities. Furthermore, CEDTI indicates that it is not aware of any quantitative information available to estimate ammonia emissions from operation of the DMRF. Therefore, the potential for ammonia emissions from the proposed DMRF could not be evaluated quantitatively.

The majority of materials handled in the DMRF will be high moisture-content dredged materials with little potential for dust emissions. Dry additive filling, storage and transfer equipment will be

contained in enclosed structures with baghouse dust collectors for high-efficiency dust control. As a result, $PM_{2.5}/PM_{10}$ emissions from the DMRF will be negligible, with uncontrolled emissions currently estimated at less than 1 TPY. Based on estimated uncontrolled $PM_{2.5}/PM_{10}$ emissions, an Air Quality Permit to Construct will not be required prior to construction of the DMRF additive material storage, transfer, mixing and dust control equipment.

Based on this analysis, direct emissions from dredging activities, indirect emissions from haul trucks and commuting construction workers, and fugitive dust emissions, are not expected to significantly affect ambient air quality in the Project Area. These emissions and impacts will be restricted to the construction period, approximately 36 months, for the LNG Terminal and will terminate once construction has been completed.

B. Operational Emissions

Based on information provided by CEDTI, post-construction maintenance dredging activities would result in periodic emissions, typically occurring over an approximately one-month period at three-year intervals during operation of the LNG Terminal. Estimates of emissions from maintenance dredging activities are included in Appendix 9A and summarized in Table 9.3-5. In addition, for a period of approximately 12 months following completion of the LNG Terminal construction, emissions from transport of PDM to end-use sites will occur. This transportation was factored into the overall emissions estimates for the DMRF.

9.3.2.4 Nonjurisdictional Facilities – Power Plant

A. Construction Emissions

Any construction activities, equipment and emissions associated with the Power Plant will be similar to those described in Section 9.3.2.2.A for construction of the LNG Terminal. The use of equipment to construct the Power Plant would result in temporary, short-term emissions of air pollutants that would be restricted to the construction period for the Power Plant and that would terminate once construction has been completed. These emissions would not result in significant adverse impacts to the air quality within the vicinity of the Project Area, and AES would not be required to obtain any federal, state, or local authorizations for the temporary, short-term air pollutant emissions that will be associated with construction of the Power Plant. Fugitive dust control measures, if required to be implemented, are discussed in Section 9.3.6.

As with construction of the LNG Terminal, construction activities associated with the Power Plant would involve the use of internal combustion engines in various cranes, backhoes, dozers, loaders, pavers, trucks, welders, generators, air compressors, pumps, pile drivers, and other miscellaneous heavy construction equipment. These engines and worker commuting vehicles would result in emissions of NO_X, SO_2, CO, PM_{10} and VOC. The duration of the main construction period for the Power Plant would be about 20 to 24 months.

The potential for fugitive dust emissions during construction periods would be the same as discussed for the LNG Terminal construction. AES would use the mitigation measures identified in Section 9.3.6 of this Resource Report to minimize the fugitive dust emissions associated with construction of the LNG Terminal.

AES has estimated the actual emissions of criteria air pollutants and HAPs that would be associated with construction of the Power Plant, based on the assumptions and detailed calculations provided in Appendix 9A of this Resource Report and as summarized in Section 9.3.2.1. AES's assumptions concerning the types, numbers and operating schedules for the various construction equipment and activities are based on information provided by construction contractors being considered for the Power Plant.

Table 9.3-4 summarizes the estimated emissions from construction equipment potentially associated with the Power Plant construction. Emissions are summarized in total tons during each year of the construction period. All emissions would occur in Baltimore County in AQCR 115.

Based on this analysis, direct emissions from construction equipment, indirect emissions from commuting construction workers, and fugitive dust emissions, are not expected to significantly affect ambient air quality in the Project Area. These emissions and impacts would be restricted to the construction period, approximately 24 months, for the Power Plant and would terminate once construction has been completed.

B. Operational Emissions

If constructed and operated, the combined cycle Power Plant would operate in lieu of or in conjunction with the hot water heaters, depending upon the operating scenario. The Power Plant would be configured with one combustion gas turbine (CGT) with a duct-fired heat recovery steam generator (HRSG), which would operate only on natural gas, and associated steam electric turbine and other auxiliary facilities that are not sources of potential emissions. The output of the Power Plant would be approximately 300 MW. The Power Plant would require a gas supply from the LNG Terminal and installation and operation of transmission lines to tie into the local utility system. Another minor source of PM_{10} and $PM_{2.5}$ emissions associated only with the Power Plant would be a cooling tower, which would run intermittently when there is insufficient LNG gas flow (sendout) to provide cooling for the Power Plant Rankine cycle but the Power Plant continues to operate.

AES is currently evaluating two alternate gas turbine vendors for supply of major Power Plant components. Based on the results of preliminary engineering design, a General Electric (GE) 7FA CGT and a Siemens SGT6-5000 CGT are being considered. While performance specifications, emissions, and controls are similar for each CGT, information for the Siemens SCT6-5000 was used for emissions estimation purposes to provide a more conservative analysis. The base case operating scenario involves operation of the CGT with auxiliary duct firing in the HRSG at 100 percent loads for 8,760 hours per year and one of the LNG Terminal hot water heaters running at idle standby (25 percent load). The alternate operating scenario involves the CGT at 100 percent load, unfired HRSG, one hot water heater at 100 percent load, and one hot water heater at idle standby for 20 percent of the year with the base case operating scenario for 80 percent of the year. The CGT and auxiliary burner in the HRSG would be rated at maximums of 2,089 and 271 MMBtu/hr (LHV), respectively. It is assumed that there would be two catalyst malfunctions per year in the HRSG and hot water heater, lasting 48 hours each, resulting in uncontrolled emissions. Furthermore, it was assumed that the CTG/HRSG and hot water heaters would undergo three cold iron startups per year with 300 minutes duration each. These operating scenarios were used as the basis for the estimated short-term and annual potential emissions from the Power Plant. Table 9.3-5 summarizes maximum emission rates for the Power Plant based on these assumptions. Criteria pollutant emissions factors were based on a review of recent BACT and LAER determinations for similar types and sizes of natural gas fired CTGs with HRSGs and from preliminary emissions guarantees from potential vendors. The proposed emissions control systems would include dry low-NO_X combustors (DLN) for initial NO_X control in the CTG, SCR for final NO_X control and oxidation catalysts for CO control. The emissions analysis demonstrates that potential emissions from the LNG Terminal with Power Plant, when combined with potential emissions from the LNG ship offloading operations, would be greater than EPA major stationary source thresholds for NO_X, VOCs and CO. Accordingly, the LNG Terminal with the Power Plant will be required to undergo NNSR for NO_X and VOCs and PSD review for NO_2 and CO[5].

The same minor and intermittent emission sources identified in Section 9.3.2.2.B associated with the LNG Terminal will still be associated with the LNG Terminal if the Power Plant is constructed. Again, these sources will only operate in the event of an emergency or electrical power interruption, and include several small diesel reciprocating engines used for emergency fire water pumping and standby electricity generation. In addition, the heated vent stack discussed in Section 9.3.2.2.B will still be associated with the LNG Terminal if the Power Plant is constructed.

9.3.3 Air Quality Regulatory Requirements

The proposed Project would generate air emissions through both short-term construction activities and long-term operation of the stationary sources associated with the LNG Terminal and, if applicable, the

[5] Section 9.3.3.1.A discusses the potential applicability of the 100 TPY PSD threshold for listed source categories and the 250 TPY threshold for non-listed sources

Power Plant. Emissions from all phases of construction and operation of the Project would be subject to applicable federal and state air regulations. This section evaluates applicability of specific air regulations to emissions units and activities associated with the Project.

9.3.3.1 New Source Review Requirements

The NSR provisions of the CAA apply to new Major Stationary Sources or Major Modifications to Major Stationary Sources under two separate programs. For sources located in areas designated as attaining the Ambient Air Quality Standards, with respect to a specific regulated criteria pollutant, the requirements of the PSD program (40 CFR § 52.21) apply. For Major Stationary Sources located in areas that do not attain the Ambient Air Quality Standards, the requirements of the NNSR Program (40 CFR Parts 51 and 52) apply to each non-attainment pollutant. The LNG Terminal and Power Plant (if built) will involve construction and operation of a new stationary source in Maryland. Evaluation of the applicability of NSR regulations to these sources is discussed below. Administration of NSR programs in Maryland is provided by MDE's SIP-approved regulations promulgated under Code of Maryland Regulations (COMAR) Section 26.11 with respect to the LNG Terminal. There will be no modification of existing or construction of new stationary sources associated with the Pipeline construction or operation in Maryland or Pennsylvania, or dredging activities in Maryland. Therefore, NSR regulations are not applicable to the Pipeline or dredging activities.

As discussed in Section 9.3.2.2.B., for the purposes of the major stationary source applicability determinations under PSD and NNSR rules, total potential emissions associated with operation of the LNG Terminal are assumed to include the combination of emissions from stationary emission units at the LNG Terminal with those emissions from LNG ships associated solely with LNG offloading activities while the LNG ships are at berth. The offloading activities are included in the major source applicability determination because the transfer of fuels from LNG ships is directly connected to the function of the LNG Terminal. This conservative approach is consistent with EPA guidance provided in the 1990 Draft New Source Review Workshop Manual, as well as EPA policy documents on this subject[6].

A. PSD Requirements

MDE's approved SIP provides the authority to issue air permits in accordance with federal PSD regulations (40 CFR § 52.21), which are designed to ensure that the air quality in current attainment areas does not significantly deteriorate beyond baseline concentration levels. The PSD regulations specifically apply to the construction of EPA-defined Major Stationary Sources and Major Modifications to existing Major Stationary Sources in areas designated as attainment for at least one of the following criteria pollutants: SO_2, NO_2, PM_{10}, CO, O_3, and lead. In addition, pursuant to EPA's proposed implementation of $PM_{2.5}$ standards, states are in the process of developing SIP revisions that would include applicability and review criteria for $PM_{2.5}$ emissions. In the meantime, EPA has advised states to use the PM10 requirements as a surrogate for PM2.5. For PSD purposes, a Major Stationary Source is defined as one of 28 listed source categories with the potential to emit 100 TPY or more of any pollutant regulated under the CAA. A non-listed Major Stationary Source is defined as a source with the potential to emit 250 TPY or more of any regulated pollutant. PSD applies on a pollutant-specific basis at Major Stationary Sources for each pollutant with the potential to be emitted at greater than EPA-defined Significant Emission Rates: 100 TPY CO; 40 TPY NO_X, SO_2 or VOC; 25 TPY TSP; 15 TPY PM_{10}; 0.6 TPY Pb. For $PM_{2.5}$, EPA has proposed to apply a Significant Emission Rate of 10 TPY of direct $PM_{2.5}$ emissions and 40 TPY of precursor SO_2 emissions. If other precursors are included for determination of major source applicability to $PM_{2.5}$, a 40 TPY Significant Emission Rate would be used for precursor NO_2 emissions and other Significant Emission Rate thresholds may apply to precursor VOC and ammonia emissions, as determined by the state's SIP.

Based on the attainment status of the area (see Section 9.3.1.3) and on projected emission levels (see Sections 9.3.2.2 and 9.3.2.4), the LNG Terminal will not be considered a Major Stationary Source with respect to the PSD regulations and is not subject to PSD review, regardless of whether the 100 TPY or 250 TPY applicability threshold is determined to apply (i.e., potential emissions of all

[6] Letter from John Calcagni, EPA AQMD to Ken Waid, January 8, 1990 re: clarification on questions concerning "secondary emissions" as defined in 40 CFR 52.21(b); Letter from Charles Sheehan, EPA Regional Counsel to Michael Cathey, October 28, 2003.

attainment pollutants are below 100 TPY). [7] However, if AES decides to construct and operate the Power Plant, it would be subject to PSD review for NO_2 and CO if the 100 TPY threshold applies but would not be subject to PSD review if the 250 TPY threshold is determined to apply in this case. AES is in the process of contacting EPA and MDE to further evaluate PSD applicability to the Power Plant and to request a formal determination. AES anticipates that the contact and discussion with MDE will be completed by the end of the first quarter of 2007.

If AES decides to construct and operate the Power Plant, it will apply for the appropriate permits, as necessary. If PSD review is triggered, all stationary sources at the premise must demonstrate compliance with PSD requirements for each pollutant with potential emissions above Significant Emission Rates. AES understands that, if it decides to construct and operate the Power Plant, it will not be considered separate from the LNG Terminal with respect to NSR requirements. Even if AES applies for and receives permits for the LNG Terminal stationary sources and subsequently submits applications for the Power Plant, the combined emissions from the LNG Terminal and Power Plant will be used for the purpose of PSD and NNSR applicability determinations. If PSD review applies, all requirements will apply to LNG Terminal and Power Plant sources.

PSD review for Major Stationary Sources and Major Modifications includes the following: an assessment of the existing air quality; the use of analytic dispersion models to demonstrate compliance with the NAAQS and applicable PSD Increments; a demonstration that Best Available Control Technology (BACT) has been applied to the subject emission sources; and an assessment of the impact of new emissions on the environmental resources such as soils and vegetation. If the source is located within 100 km (62 miles) of a federal Class I area, the impacts must be evaluated at these areas based on the more stringent Class I PSD increments. The PSD permit would contain emission limits and other operating, monitoring, record keeping, and reporting requirements.

The air quality modeling includes emissions from the proposed Major Stationary Source or Major Modification and other sources in the area to ensure protection of the NAAQS and to prevent emission increases beyond a specified amount, called a PSD Increment. Because the LNG Terminal and associated LNG ship unloading operations, without the Power Plant, will not be a Major Stationary Source subject to PSD review, an air quality modeling demonstration is not required by MDE or EPA PSD regulations specifically for that Project configuration. However, if it is determined that the 100 TPY PSD applicability threshold applies to the Power Plant, the Power Plant will trigger PSD review for the Power Plant and the Terminal sources, including the air quality modeling demonstrations. In that case, the results of the air quality dispersion modeling analysis demonstrating compliance with the NAAQS and PSD Increments will be included in the PSD permit application submitted to the Maryland Public Service Commission (MPSC) for review by that agency with input from MDE (see Section 9.3.3.1.C). If AES proceeds with the Power Plant option, it is anticipated that the PSD permit application for the Power Plant will be submitted to MPSC by April 2007, with copies provided to FERC.

Separate from the potentially applicable PSD modeling requirements, AES completed an air quality modeling analysis for both LNG Terminal options (with and without the Power Plant) to satisfy the FERC Staff's interpretation of its obligation under National Environmental Policy Act (NEPA) to evaluate anticipated air quality impacts for the Project (see Section 9.3.5). This modeling analysis includes an analysis of impacts from the LNG Terminal with and without the Power Plant, and includes

[7] The 28 listed source categories subject to PSD review for which a 100 TPY applicability threshold would apply include fossil fuel boilers (or combination of them) totaling more than 250 million Btu per hour heat input and fossil fuel-fired steam electric plants of more than 250 million Btu per hour heat input. AES has not yet determined through consultation with MDE whether these source categories potentially would include the CTG with auxiliary fired HRSG and four hot water heaters. However, certain recent air quality impact analyses have not treated similar sources at LNG terminals as falling within one of the 28 listed source categories. For example, the FERC DEIS for the Broadwater Energy floating LNG storage and regasification unit (November 2006) was assumed not to be one of the listed 28 source categories and, on that basis, a 250 TPY applicability threshold was applied. Similarly, the DEIS for the Gulf LNG Energy Project discusses a May 1, 2006 applicability determination issued by the Mississippi Department of Environmental Quality indicating that the proposed LNG terminal would not be treated as one of the 28 listed source categories. On that basis, the terminal would not trigger PSD review as long as the potential to emit for all stationary sources at the terminal would not exceed 250 TPY for any attainment criteria pollutant.

impacts from LNG ship offloading operations. Separate model runs were also performed to evaluate impacts of marine vessels associated with LNG ship movements in the Project Area.

The emission limits contained in the PSD permit are required to represent the BACT. BACT is determined on a case-by-case basis, taking into account energy, environmental, and economic impacts and costs. Based on a review of previous BACT and LAER determinations for other combined cycle power plants, the proposed controls and emissions limits for the Power Plant are considered representative of BACT. Further, based on a review of previous BACT and LAER determinations for boiler and hot water heater equipment, the proposed controls and emission limits for the LNG Terminal are also considered representative of BACT.

The PSD program was designed to protect air quality in areas where existing air quality was considerably better than the NAAQS. The program established a set of increments of new air pollution that would be allowed over a baseline level for three classes of areas. Class I areas are areas of special national or regional value from a natural, scenic, recreational, or historic perspective and include such areas as National Parks, Fish and Wildlife Service Areas and National Wilderness Areas. In addition to restrictive Class I PSD increments for SO_2, PM and NO_2, select Class I areas were additionally protected through adoption of visibility protection requirements. For a project meeting the PSD regulatory definition of a Major Stationary Source or Major Modification and with emission source(s) typically located within 100 km (62 miles) of a Class I area, an impact analysis must be performed to demonstrate that stringent Class I PSD increments will not be exceeded and that other air quality related values (AQRVs) are not adversely impacted. The nearest PSD Class I areas to the LNG Terminal and Power Plant site are the Shenandoah National Park in Virginia (about 145 km southwest of the LNG Terminal and Power Plant) and Brigantine National Wilderness Area in southeastern New Jersey (about 193 km east of the site). The Power Plant would be located more than 100 km (62 miles) from the nearest Class I area and, as such, a Class I area impact analysis would not be automatically triggered in this case. However, as part of the PSD review process (if the Power Plant will be subject to PSD review), the MDE will likely provide information on the Project's estimated emissions and impacts to the Federal Land Manager responsible for overseeing the nearest Class I areas.

B. Non-attainment New Source Review Requirements

The CAA established more stringent provisions for New Source Review of Major Stationary Sources proposed to be located in non-attainment areas. MDE regulations implementing those provisions are codified in COMAR 26.11.17. Because the LNG Terminal and Power Plant will be located in Baltimore and the Baltimore AQCR has been designated as nonattainment with respect to certain criteria air pollutants, the Project is potentially subject to certain NNSR requirements if potential emissions of NO_X or VOC will be greater than 25 TPY. In addition, the MDE may establish requirements under NNSR for emissions of PM-2.5, for which the Baltimore AQCR also has been classified as non-attainment.

Based on the attainment status of the area (see Section 9.3.1.3) and on projected emission levels (see Section 9.3.2), the LNG Terminal will be subject to NNSR for NO_X emissions and the Power Plant would be subject to NNSR for NO_X and VOC emissions. Applicable NNSR permitting requirements would include an emission limitation that represents LAER for the source, obtaining NO_X equivalent emission reductions (offsets) from existing sources in the area in the ratio of 1.3 to 1 for sources located in Baltimore (although the one-hour standard has been rescinded at the federal level, the area continues to be subject to the severe nonattainment rules in Maryland's approved SIP, COMAR 26.11.17.03.B(3)(a)), and an alternatives analysis to demonstrate that the benefits of the proposed source significantly outweigh the environmental and social impacts.

C. State Permit to Construct Requirements

Pursuant to COMAR 26.11.02.09, all air pollution sources subject to PSD, NNSR, NSPS, and National Emissions Standards for Hazardous Air Pollutants (NESHAPS) requirements and all other sources, except those specifically exempted in COMAR 26.11.02.10, are required to apply for and obtain a permit to construct. Maryland is authorized by EPA through its approved SIP to implement both the PSD and NNSR programs. Therefore, in addition to the permit to construct, sources subject to PSD and/or NNSR are required to obtain additional PSD and NNSR permits, called Approvals. The

purpose of the permit to construct is to ensure that any new, modified, replaced or relocated source of air pollution complies with all applicable State and federal air quality regulatory requirements. The NNSR and PSD Approvals are required to enforce applicable PSD and NNSR requirements. Therefore, the four hot water heaters, six of the emergency fire water pumps, emergency generator, and vent stack heater at the LNG Terminal will require permits to construct.

In the case of the Power Plant, which will be rated at greater than 70 MW and, as such, will be subject to review by the MPSC, AES will be required to apply for a Certificate of Public Convenience and Necessity from the MPSC instead of the MDE. The MPSC has been authorized and SIP-approved to issue PSD and NNSR Approvals, with MDE input, for all power plants in Maryland with a generating capacity greater than 70 MW.

9.3.3.2 MDE Title V and State Operating Permit Requirements

Under MDE's Title V Operating Permit regulations (COMAR 26.11.03), a Title V permit is required for Major Stationary Sources (as defined under COMAR 26.11.02.01). For Title V applicability purposes, a Major Stationary Source is defined differently than a Major Stationary Source under PSD review, with potential emissions thresholds established at 10 TPY for any individual HAP, 25 TPY for any combination of HAPs, 25 TPY for NO_X or VOC in Baltimore and 100 TPY for any other regulated air pollutant. Based on the estimated potential emissions from the LNG Terminal as presented in Section 9.3.2, the LNG Terminal will be a Major Stationary Source subject to Title V permitting. The owner or operator of a source that becomes subject to the requirement to obtain a Part 70 permit must submit an application not later than 12 months after the date that the source commences operations or becomes subject to the requirements for a Part 70 permit, whichever is later (COMAR 26.11.03.02.B(4)). The purpose of the Title V operating permit is to combine, into a single document, all the state and federal air quality requirements applicable to all sources located on the same premise. Title V is not intended to impose new substantive requirements above and beyond the applicable federal and state requirements.

9.3.3.3 New Source Performance Standards Requirements

As natural gas-fired hot water heaters with heat inputs greater than 100 MMBtu/hr, the four proposed heaters at the LNG Terminal are subject to Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units (NSPS, 40 CFR Part 60, Subpart Db). Although Subpart Db contains emissions standards and/or control requirements for SO_2 and PM from boilers combusting coal, oil, wood and other fuels, it contains no SO_2 or PM standards applicable to natural gas fired boilers. The most stringent Subpart Db NO_X emission standard applicable to gas fired boilers with a low heat release rate is 0.1 pounds per million British thermal unit (lb/MMBtu). The hot water heaters associated with the LNG Terminal will be designed and operated in accordance with the applicable Subpart Db NO_X emission standard. The proposed NO_X emission rate (less than 0.004 lb/MMBtu) would easily meet the applicable emission standard. AES will also comply with the applicable monitoring, record keeping and reporting requirements consistent with Subpart Db.

The proposed CTG at the Power Plant would have a heat input greater than 10 MMBtu/hr and would be constructed after February 18, 2005. Therefore, the CTG and associated HRSG would be subject to Standards of Performance for Stationary Combustion Turbines (Subpart KKKK), which were promulgated on July 6, 2006 and are applicable to combustion turbines with a heat load input greater than or equal to 10 MMBtu/hr and that were constructed, modified or reconstructed after February 18, 2005. Stationary combustion turbines subject to Subpart KKKK are exempt from requirements of Subpart GG, which is applicable to combustion turbines constructed, modified, or reconstructed after October 3, 1977. In addition, HRSGs subject to Subpart KKKK are exempt from the requirements in Subparts Da, Db and Dc. Subpart KKKK sets emission limits for NO_X and SO_2. For new CTGs firing natural gas at a heat input rate of greater than 850 MMBtu/hr, such as the CTG proposed for the Power Plant, the applicable NO_X emission limit would be 15 ppmvd at 15 percent O_2. The proposed NO_X emission limit, which will also be proposed to meet BACT and LAER, is two ppmvd at 15 percent O_2 and, therefore, the CTG will easily meet the applicable limit in Subpart KKKK. The continuous emission monitoring system (CEMS) proposed for the Power Plant would also comply with the Subpart KKKK NO_X monitoring requirements. The Subpart KKKK SO_2 limit applicable to all CTGs regardless of size or fuel type is 0.58 lb/MWh gross energy output or fuel sulfur content of 0.05 percent by

weight. The proposed CTG with HRSG would be fueled exclusively with natural gas and will meet the fuel sulfur content specification.

Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, was reviewed for applicability to the LNG storage tanks at the LNG Terminal. This subpart applies to storage vessels above 75 cubic meters capacity used to store Volatile Organic Liquids (VOL). VOL is defined as any organic liquid that can emit VOC as defined in 40 CFR § 51.100. The only organic compounds with the potential to be emitted in trace amounts from LNG storage tanks are methane and ethane, both of which are specifically exempted in 40 CFR § 51.100 from the definition of VOC. Therefore, this subpart is not applicable to the LNG storage tanks.

Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, promulgated July 11, 2006, will apply to emergency fire pump engines and the emergency standby generator proposed for the LNG Terminal. The rule requires manufacturers of such engines to meet emission standards that are phased in for the size, type of engine application and model year of the engine. Owners and operators of covered engines are required to configure, operate and maintain the engines according to specifications and instructions provided by the engine manufacturer and to maintain records demonstrating compliance. AES will comply with the requirements applicable to owners and operators of covered engines.

9.3.3.4 National Emissions Standards for Hazardous Air Pollutants Requirements

The NESHAPs, codified in 40 CFR Part 61, regulate HAP emissions. Part 61 was promulgated prior to the 1990 CAAA and regulates only eight types of hazardous substances (asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride). The proposed LNG Terminal and Power Plant do not fall under one of the source categories regulated by Part 61; therefore, the requirements of Part 61 are not applicable to the Project.

9.3.3.5 National Emissions Standards for Hazardous Air Pollutants for Source Categories Requirements

Boilers and process heaters that are located at new or existing Major Stationary Sources of HAPs must meet NESHAPs for Source Categories, Subpart DDDDD - National Emission Standards for Industrial / Commercial / Institutional Boilers and Process Heaters, commonly referred to as Boiler Maximum Achievable Control Technology (MACT) standards. Subpart DDDDD emission limitations applicable to "large" (greater than 10 MMBtu/hr) gas fired boilers and process heaters include PM (0.03 lb/MMBtu), hydrogen chloride (0.0009 lb/MMBtu) and CO (400 ppm at three percent O_2). The hot water heaters at the LNG Terminal would be classified as a large boiler or process heater under the regulations and estimated emissions would easily comply with these limitations based on vendor data and/or EPA emissions factors as summarized in Appendix 9A. The HRSG at the Power Plant would be classified as a waste heat boiler, which is not subject to the regulation, because the supplemental burners to the HRSG would not be 50 percent or more of the total heat input to the HRSG based on preliminary engineering design. Based on estimated potential emissions of federal HAPs summarized in Table 9.3-6 and Appendix 9A, the LNG Terminal and the Power Plant are not classified as Major Stationary Sources of HAPs (i.e., those that have the potential to emit 10 TPY or more of a single HAP or 25 TPY or more of a combination of HAPs that are specifically listed in or pursuant to section 112(b) of the CAA). Therefore, the proposed LNG Terminal and Power Plant will not be subject to Subpart DDDDD.

Other NESHAPs for Source Categories, or MACT standards, potentially applicable to Project stationary sources include Subpart ZZZZ (NESHAP for Stationary Reciprocating Internal Combustion Engines) and Subpart YYYY (NESHAP for Stationary Combustion Turbines). Both of these NESHAPs are only applicable to Major Stationary Sources of HAPs. Based on estimated potential HAP emissions, neither the proposed LNG Terminal nor the Power Plant will be Major Stationary Sources of HAPs. Therefore, these NESHAPs do not apply to the Project. Moreover, with regard to Subpart YYYY, based on EPA's August 18, 2004 stay of effectiveness with regard to applicability of this NESHAP to lean premix gas-fired turbines and diffusion flame gas-fired turbines, Subpart YYYY

would not apply to the CTG proposed for the Power Plant, as the proposed CTG will be a lean premix dry low-NO_X design.

9.3.3.6 Acid Rain Program, Clean Air Interstate Rule (CAIR) and Clean Air Mercury Rule (CAMR) Requirements

The Acid Rain Program is codified in 40 CFR Parts 72 through 78. This program aims to reduce acid rain by reduction of SO_2 and NO_X from utility units that have a nameplate electricity generation capacity greater than 25 MW. A "unit" is defined as a "fossil fuel-fired combustion device" and "fossil fuel-fired" is defined as "the combustion of fossil fuel, alone or in combination with any other fuel, independent of the percentage of fossil fuel consumed in any calendar year". The hot water heaters at the LNG Terminal will not be used to generate electricity. However, the combined cycle Power Plant would have a generation capacity greater than 25 MW and will be subject to Acid Rain program requirements. If the Power Plant is constructed, the Acid Rain permit application must be filed at least 24 months before the unit commences operation. An affected unit is required to follow the continuous emissions monitoring requirements of 40 CFR Part 75 and to hold sufficient SO_2 allowances to cover expected emissions of SO_2 when operation commences. In the event that the Power Plant is constructed, AES would apply for the Acid Rain Permits; install, certify and operate the required monitoring systems; and comply with the required emissions allowances, monitoring, and recordkeeping requirements.

The Clean Air Interstate Rule (CAIR), 40 CFR Parts 96 and 97, requires certain states, including Maryland, to achieve significant, phased reductions in annual and ozone-season NOx emissions (as a precursor to fine particulate matter (PM2.5) and ozone formation) and annual SO2 emissions (as a precursor to PM2.5 formation), consistent with state-specific emissions budgets established by EPA. To achieve those reductions, affected states may choose to participate, to the extent applicable, in cap and trade programs for annual NOx, ozone-season NOx and annual SO2 emissions. Affected states must submit to EPA proposed revisions to its State Implementation Plan (SIP) that include the requisite NOx and SO2 emissions reductions and specify the CAIR-affected sources and control mechanisms that will be required by the state. Alternatively, affected states may become subject to the CAIR Federal Implementation Plans (FIPs), meaning that EPA would administer the CAIR program for that state. Because the State of Maryland has not yet submitted its CAIR SIP to EPA for review and approval or indicated its intention to proceed under the CAIR FIP, it is not yet clear how the State will comply with CAIR and whether the emissions reduction requirements will apply to sources other than coal-fired electric generating units. However, if AES proceeds with construction of the Power Plant, AES will comply with any CAIR requirements that may be applicable to the natural gas-fired units at the plant.

The Clean Air Mercury Rule establishes standards of performance for new and existing coal-fired electric generating units pursuant to Section 111(d) of the Clean Air Act. CAMR sets annual caps for mercury emissions from such units and creates a market-based trading program. States were required to submit SIP revisions to EPA by November 17, 2006, to implement the requirements of the CAMR. Many states, including Maryland, failed to meet the SIP submittal deadline and it is not yet clear whether Maryland will develop a state plan to adopt the CAMR or will become subject to the CAMR FIP, which was published by EPA on December 8, 2006. Under either scenario, the State's CAMR program is not anticipated to apply to new, natural gas-fired electric generating units, such as the units that would be installed at the Power Plant, if constructed. However, if AES proceeds with construction of the Power Plant, AES will comply with any CAMR requirements that may be applicable to the natural gas-fired units at the plant.

9.3.3.7 MDE Emission Standards

In addition to the MDE permit to construct, permit to operate and PSD and NNSR Approval requirements, the following state emission standards and other requirements were evaluated for applicability to the LNG Terminal and Power Plant emission sources:

- COMAR 26.11.05: Air Pollution Episode System – This chapter requires sources designated by the Secretary or the Secretary's designee to submit standby emission reduction plans and to implement such plans if a designated level of air pollution is reached. Designated sources primarily include coal and oil fired electric power

generating facilities, coal and oil fired steam producing facilities, large manufacturing industries and refuse incinerators. Any other source of air pollutants not specifically designated in the regulation may be required to submit standby plans, upon written request of the MDE, describing emission cutbacks to be taken if an air pollution Alert is called. Because the LNG Terminal and Power Plant do not involve emission sources specifically designated by regulation to prepare and submit standby plans, AES would not be subject to this requirement unless specifically requested by MDE.

- COMAR 26.11.06: General Emission Standards, Prohibitions and Restrictions – This chapter contains emissions standards and other requirements applicable to certain air pollution sources. Specific requirements pertain to visible emissions, emissions of particulate matter, CO, SO_2, VOC and fluorides, and to odors and other nuisance air pollution. The proposed hot water heaters, diesel engines and vent stack heater at the LNG Terminal, and the CTG with HRSG at the Power Plant ,will be designed to meet all applicable standards and operate in compliance with applicable limitations.

- COMAR 26.11.06.03.D: Particulate Matter from Materials Handling and Construction. This regulation requires reasonable precautions to prevent particulate matter from becoming airborne due to material handling, transport, or storage, or due to construction or demolition activities, use of roads and other activities. Reasonable precautions specified in the regulation include, but are not be limited to:

    - Use of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land.

    - Application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces that can create airborne dusts.

    - Installation and use of hoods, fans, and dust collectors to enclose and vent the handling of dusty materials. Adequate containment methods shall be employed during sandblasting of buildings or other similar operations.

    - Covering, at all times when in motion, open-bodied vehicles transporting materials likely to create air pollution. Alternate means may be employed to achieve the same results as would covering the vehicles.

    - The paving of roadways and their maintenance in clean condition.

    - The prompt removal from paved streets of earth or other material which has been transported there by trucks or earth moving equipment or erosion by water.

AES will require its contractors to use the mitigation measures identified in Section 9.3.6 of this Resource Report to minimize the fugitive dust emissions associated with construction of the Pipeline, LNG Terminal, Power Plant (if constructed), and during dredging activities. These measures may include the application of water or dust suppressants, covering of haul trucks, use of paved roads to the extent possible, limiting vehicle speed and stabilizing disturbed areas.

- COMAR 26.11.09: Control of Fuel-Burning Equipment, Stationary Internal Combustion Engines, and Certain Fuel-burning Installations – This chapter contains emissions standards and other requirements applicable to certain fuel-burning equipment, including boilers, vent heater, and diesel engines at the LNG Terminal, and the CTG with HRSG at the Power Plant. Specific requirements pertain to visible emissions, emissions of particulate matter, SO_2 and Major Stationary Sources of NO_X. The proposed combustion equipment at the LNG Terminal and Power Plant will be designed to meet all applicable standards and operate in compliance with applicable limitations.

- COMAR 26.11.15 and 26.11.16: Toxic Air Pollutants – Fuel burning equipment as defined in COMAR 26.11.09.01, such as boilers and stationary internal combustion engines associated with the LNG Terminal, and the CTG with HRSG associated with the Power Plant, are exempt from the requirements of this chapter.

- COMAR 26.11.17: Requirements for Major New Sources and Modifications – This chapter applies to Major Stationary Sources and Major Modifications with respect to non-attainment pollutants NO_X, VOC and CO. Based on estimated potential emissions from the LNG Terminal emission units, the requirements of this chapter apply to NO_X, as the LNG Terminal will be a Major Stationary Source of NO_X emissions when LNG ship offloading emissions are included. The LNG Terminal, even with offloading emissions, will not be a Major Stationary Source of VOC emissions and, therefore, will not be subject to the requirements of this chapter for VOC. In addition, the LNG Terminal will not be located in a non-attainment area for CO. However, based on estimated potential emissions, the LNG Terminal together with the Power Plant, and including LNG offloading emissions, will be a Major Stationary Source of NO_X and VOC and, therefore, will be subject to the NSR requirements in this chapter. The applicable requirements for sources subject to NSR are summarized in section 9.2.3.1.2.

- COMAR 26.11.29 and 26.11.30: NO_X Reduction and Trading Program – These chapters apply to affected trading sources, which are defined as fossil fuel fired electric generating units that serve a generator with a name plate capacity greater than 25 MW or non-electric generating units that have a maximum design heat input greater than 250 MMBtu/hr. The proposed hot water heaters at the LNG Terminal are fossil fuel fired stationary boilers with a maximum design heat input of 345 MMBtu/hr and are, therefore, classified as non-electric generating units subject to the requirements. The CTG with HRSG at the proposed Power Plant would be a fossil fuel fired electric generating unit that would serve a generator with a name plate capacity of approximately 300 MW and will sell electricity. Therefore, the combined cycle Power Plant would also be subject to Maryland's NO_X Reduction and Trading Program. In general, COMAR 26.11.29 requires an affected trading source to acquire sufficient NO_X allowances for the control period each year at least equal to the affected trading source's NO_X emissions for the control period. Allowances from a "set-aside pool" are made available by the MDE to accommodate new affected trading sources or "clean air projects", defined as a new or modified fossil fuel electric generator with state-of-the-art NO_X controls demonstrated to be more efficient than existing electric generation. An affected trading source must also install, operate, maintain, and certify a NOx CEM or other approved monitoring method in accordance with 40 CFR Part 75, Subpart H and comply with the monitoring requirements in 40 CFR Part 96, Subpart H. COMAR 26.11.30 is referenced throughout Chapter 26.11.29 and establishes procedural requirements to implement Maryland's NO_X Reduction and Trading Program. The proposed hot water heaters at the LNG Terminal and combined cycle Power Plant will be designed to meet all applicable standards and operate in compliance with applicable monitoring and NO_X emissions trading requirements.

9.3.3.8 PDEP Emission Standards

The Pipeline will not involve the construction of new or modification of existing stationary sources of air pollutant emissions in Pennsylvania, such as a compressor station. Therefore, the portion of the Pipeline in Pennsylvania will not be subject to PDEP air quality control regulations with the exception of those concerning prohibition of certain fugitive emissions (25 Pa.C.S. § 123.1). These requirements are similar in scope and applicability to those Maryland regulations referenced in Section 9.3.3.7 for control of fugitive emissions (COMAR 26.11.06.03.D).

9.3.3.9 Control of Air Pollutant Emissions from Mobile Sources

As discussed in Section 9.3.2, during construction of the Project, AES's contractors will use construction equipment that will result in mobile source emissions of TSP, PM_{10}, NO_X, SO_2, CO, and

VOC. These mobile sources would be subject to federal and state regulations and standards applicable to the manufacturer, owner, or operator of the equipment.

A. EPA Regulations for Mobile Source Emissions

EPA has adopted regulations for the control of air pollutant emissions from nonroad, mobile source engines (See 40 CFR Parts 89, 90, 91, and 94 for requirements applicable to nonroad compression-ignition, spark-ignition, marine spark-ignition and marine compression-ignition engines, respectively). These regulations potentially apply to the manufacturer, owner, or operator of certain of the equipment that will be used to construct and operate the Project. AES will not manufacture, own, or operate any construction equipment and, therefore, is not required to obtain any authorizations from EPA for the air pollutant emissions that will be associated with the use of equipment to construct and operate the Project. In addition, the standards applicable to marine compression-ignition engines (40 CFR Part 94) do not apply to engines on foreign vessels. Any U.S. flagged or registered vessels equipped with affected compression ignition engines manufactured after January 1, 2004 would meet all applicable requirements of this subpart; however, there are currently no U.S. flagged LNG vessels.

EPA has also adopted regulations for control of nonroad, locomotive and marine diesel fuel sulfur content (See 40 CFR Part 80, Subpart I) that phase is significantly lower diesel fuel sulfur contents. The applicable limits for marine diesel engines are 500 ppm sulfur (0.05 percent) beginning June 1, 2007 and 15 ppm sulfur (0.0015 percent) beginning June 1, 2012. These limits will apply to assist tugs used during LNG tanker ship deliveries to the LNG Terminal.

B. MDE Regulations for Mobile Source Emissions

MDE also has adopted regulations for the control of air pollutant emissions from certain mobile sources (See COMAR 26.11.20). The MDE regulations include visible emissions standards applicable to ships, motor vehicle emissions control requirements, motor vehicle fuel specifications, diesel vehicle emissions control requirements, heavy duty diesel engine emissions standards and other requirements applicable to certain mobile sources offered for sale or lease in Maryland. AES will not sell or lease any mobile source equipment that may be used to construct and operate the Project and, therefore, is not required to obtain any authorizations from MDE for the air pollutant emissions that will be associated with the use of equipment associated with the Project. AES's contractors will be required to make an assessment of the applicability of these requirements to their equipment and operations.

C. PDEP Regulations for Mobile Source Emissions

PDEP regulations at 25 Pa.C.S. § 126.50 adopt and incorporate by reference certain provisions of the California Exhaust Emission Standards and Test Procedures for Heavy-Duty Diesel Engines and Vehicles. However, the Pennsylvania Heavy-Duty Diesel Emissions Control Program specifically exempts heavy duty diesel engines for offroad use. The PDEP regulations include heavy duty diesel engine emissions standards, testing and other requirements applicable to certain mobile sources offered for sale or lease in Pennsylvania. AES will not sell or lease any mobile source equipment that may be used to construct and operate the Pipeline in Pennsylvania and, therefore, is not required to obtain any authorizations from PDEP for the air pollutant emissions that will be associated with the use of mobile source equipment associated with the Pipeline construction in Pennsylvania. AES's contractors will be required to make an assessment of the applicability of these requirements to their equipment and operations.

9.3.3.10 General Conformity of Federal Actions

Under the CAA, a general conformity determination is required for any project constituting a federal action that is not otherwise subject to NSR permitting and will be undertaken in a nonattainment or maintenance area, and for which the emissions of certain air pollutants will exceed applicable threshold rates. The portions of the LNG Terminal and the Power Plant (if built) that will be subject to NSR permitting are not subject to the general conformity review process. Therefore, only direct and indirect emissions from construction of the LNG Terminal and Power Plant, construction and operation of the Pipeline and from vessel activity and indirect emissions during operation of the LNG Terminal and Power Plant, are potentially subject to general conformity review. These portions of the Project

will be undertaken in Air Quality Control Regions in Maryland, Pennsylvania, and Virginia (LNG ship movements in State of Virginia waters only) that have been designated moderate or marginal ozone nonattainment areas with respect to the 8-hour ozone standard, and will be considered federal actions. As such, these portions of the Project will require a general conformity determination if the estimated actual emissions of NO_X or VOCs (as ozone precursors) will exceed 100 TPY or 50 TPY, respectively. Based on the estimated emissions summarized in Table 9.3-4, the portions of the Project subject to general conformity review will have NO_X emissions originating both in Maryland and Pennsylvania that will exceed these thresholds during each year of construction of the Project, except 2010 in Pennsylvania. In addition, VOC emissions from construction of the Project in Maryland during 2009 are estimated to exceed the 50 TPY threshold. As summarized in Table 9.3-5, marine vessel emissions originating in Maryland and Virginia during operation of the Project will also exceed the applicable NO_X thresholds. Therefore, separate conformity determinations must be made for Maryland, Virginia and Pennsylvania.

The LNG Terminal facilities and the Pipeline are also within areas designated as non-attainment for $PM_{2.5}$ in Maryland and Pennsylvania. Applicability is evaluated for direct emissions of $PM_{2.5}$ as well as precursor emissions, which include SO_2, NO_X, VOC and ammonia. As such, the portions of the Project subject to conformity review will require a general conformity determination if the estimated actual direct $PM_{2.5}$ or SO_2 emissions will exceed 100 TPY, or if emissions of NO_X (unless determined not to be a significant precursor), VOC or ammonia (if determined to be significant precursors) will exceed 100 TPY, or if Pb emissions will exceed 25 TPY. Direct emissions of $PM_{2.5}$ from those portions of the Project subject to conformity review will not exceed the 100 TPY threshold in Maryland or Pennsylvania during construction or operation of the Project. However, precursor SO_2 emissions in Maryland due to LNG ship transit during LNG Terminal operations are estimated to exceed the 100 TPY SO_2 de minimis threshold. In addition, if precursor NO_X emissions are required by the applicable SIP to be included in the threshold determination, then NO_X emissions from construction of the Project in Maryland and Pennsylvania (only for 2009), and for operation of the Project in Maryland (due to LNG ship transit), will also trigger a $PM_{2.5}$ general conformity determination for $PM_{2.5}$ precursor emissions in these states. Therefore, separate conformity determinations for $PM_{2.5}$ must be made for Maryland and may also be necessary for Pennsylvania if precursor NO_X emissions are included in the $PM_{2.5}$ SIPs.

According to section 176(c)(1) of the CAA (40 CFR § 51.853 and Part 93, Subpart B)[8], a federal agency cannot approve or support any activity that does not conform to an approved SIP. A conformity analysis must show that the emissions would not cause or contribute to new violations of the NAAQS in any area, increase the frequency or severity of any existing violation of any NAAQS, or delay timely attainment of any NAAQS or interim emission reductions. Options for demonstrating conformity include demonstration that the project/action is specifically identified and accounted for in the SIP; obtaining documentation from the State that the emissions are included in the SIP; obtaining state commitment to include the emissions in the SIP; mitigation of the emissions; or offsetting the emissions using emissions reductions within the same nonattainment area. Each of the affected states where a conformity determination will be necessary will play important roles in the review of emission inventories and consultation on specific emission mitigation or offset requirements. Options for general conformity for affected portions of Maryland, Virginia and Pennsylvania are under development. AES submitted a preliminary draft general conformity determination for review to MDE, Pennsylvania Department of Natural Resources (PA DNR) and Virginia Department of Environmental Quality (VA DEQ) in January 2007. Following consultations with MDE, PA DNR and VA DEQ, AES will submit a refined draft conformity determination to the FERC, MDE, PA DNR and VA DEQ which is currently anticipated to be completed by April, 2007.

9.3.3.11 EPA Chemical Accident Prevention Provisions and OSHA Process Safety Management

40 CFR Part 68, Chemical Accident Prevention Provisions, are Federal regulations designed to prevent the release of hazardous materials in the event of an accident and minimize impacts when releases do occur. The regulations contain a list of substances and threshold quantities for determining applicability of the rule to a facility. If a facility stores, handles or processes one or more substances

[8] Maryland, Pennsylvania and Virginia have approved general conformity regulations (COMAR 26.11.26.09, 25 Pa.C.S. § 127.802 and VAC 5 Chapter 160, respectively). Maryland and Pennsylvania General Conformity regulations adopt and incorporate 40 CFR Part 93, Subpart B by reference. Virginia has adopted its own General Conformity regulations.

on this list and at a quantity equal or greater than specified in the regulation, the facility must prepare and submit a risk management plan (RMP). If a facility does not have a listed substance on-site, or the quantity of a listed substance is below the applicability threshold, the facility is not required to prepare an RMP. However, it still must comply with requirements of the general duty provisions in Section 112(r)(1) of the 1990 CAAA if it has any regulated substance of other extremely hazardous substance on-site. The general duty of the provision is as follows:

> "The owners and operators of stationary sources producing, processing, handling and storing such substances have a general duty to identify hazards which may result from such releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur."

With the exception of natural gas constituents (*e.g.*, methane, ethane, propane, etc.), no regulated substance would be handled or stored in quantities greater than the applicability threshold. Natural gas pipelines are not covered if they are regulated by the U.S Department of Transportation (USDOT) or an equivalent state natural gas program certified by USDOT in accordance with 49 U.S.C § 60105. In addition, storage of natural gas incidental to transportation (e.g., gas taken from a pipeline during non-peak periods and placed in storage, then returned to the pipeline when needed) is not covered. Consequently, an RMP is not required for any portion of the Project. AES would be required to maintain awareness of hazard issues and meet the goals of the above-listed general duty provisions.

The applicability of the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals (PSM), to the Project was also evaluated. Based on standard interpretations published by OSHA in response to questions on PSM applicability to LNG facilities, OSHA has concluded that current USDOT regulations in 49 CFR Parts 192 and 193 and enforced by the Pipeline and Hazardous Materials Safety Administration cover LNG and gas transmission and distribution processes, and that OSHA is precluded from enforcing the PSM standard with respect to working conditions associated with fire and explosion hazards of these processes. Therefore, the Pipeline and LNG Terminal, which are subject to 49 CFR Parts 192 and 193, respectively, are not subject to the PSM regulations.

9.3.4 Potential Air Quality Impacts of Proposed Project Due to Construction

Emissions associated with the construction of the Pipeline, LNG Terminal, dredging activities and the nonjurisdictional Power Plant were separately analyzed in Section 9.3.2 of this Resource Report, and the estimated construction emissions are summarized by Project component, by state, by AQCR, by year and for the entire Project in Table 9.3-4. Construction emissions and impacts will be restricted to the construction period, approximately three years in total, and will terminate once construction has been completed. In addition, emissions from Pipeline construction will not be concentrated for any extended period within any particular location along the Pipeline route. Based on this analysis, direct emissions from combustion equipment, indirect emissions from commuting construction workers and from haul trucks, and fugitive dust emissions are not expected to significantly impact ambient air quality in the Project Area.

Project construction emissions will need to be further assessed to support this conclusion in accordance with the General Conformity requirements. As discussed in Section 9.3.3.10, the general conformity determination for non-exempt federal actions must demonstrate compliance with applicable provisions of the Maryland and Pennsylvania SIPs, such that construction and operation of the proposed Project will not delay attainment of the ozone and $PM_{2.5}$ NAAQS. Mitigation measures required to comply with general conformity include a demonstration of consistency with applicable control measures and regulations that are relied upon in the applicable SIP, a demonstration that direct and indirect emissions have been identified and accounted for in the SIP attainment demonstration or the emissions must be offset through a SIP revision or other enforceable measure so that there is no net increase in emissions. In addition, mitigation measures to suppress fugitive dust generation during Project construction will be implemented as discussed in Section 9.3.6.

9.3.5 Potential Impact of Proposed Project Due to Facility Operation

As discussed in Section 9.3.2, the LNG Terminal and nonjurisdictional Power Plant (if built) will have permanent stationary sources of air pollution resulting in long term air pollutant emissions. The Pipeline and dredging activities associated with the LNG Terminal will not involve the construction of new or modification of existing stationary sources of air pollutant emissions and, therefore, will not have any long term air quality impacts. The primary air emissions sources at the proposed LNG Terminal will include natural gas fired hot water heaters controlled with state-of-the art emissions control systems to meet applicable LAER requirements for NO_X, as described in Section 9.3.6. Use of these controls to meet stringent emissions limitations will minimize ambient impacts from the LNG Terminal. The LNG Terminal will also include a number of small diesel engines used for emergency fire water pumping and standby electricity generation that will only operate during emergency conditions or electrical power interruptions.

If AES decides to construct the Power Plant, a CTG with HRSG would be added to the LNG Terminal and would provide different operating scenarios for the hot water heaters. Estimated potential emissions from the LNG Terminal with the Power Plant would classify the premise as a Major Stationary Source under EPA and MDE regulations and emissions from all sources at the LNG Terminal and Power Plant would be required to meet LAER for NO_X and VOC emissions and potentially BACT for CO emissions. The proposed CTG with HRSG and the LNG Terminal hot water heaters would each be equipped with state-of-the-art emission controls to meet stringent LAER or BACT requirements, as applicable and as described in Section 9.3.6, to minimize ambient impacts from the Power Plant and LNG Terminal.

Regardless of whether a PSD air quality impact analysis is required for the LNG Terminal, AES has completed an air quality modeling analysis of both LNG Terminal options (with and without the Power Plant) to satisfy the FERC Staff's interpretation of its obligation under NEPA to evaluate potential air quality impacts associated with the Project. This modeling analysis includes an evaluation of impacts from the LNG Terminal with and without the Power Plant, and a cumulative analysis of impacts from the LNG Terminal including LNG ship offloading operations. Separate model runs were also performed to evaluate the combined effects of the LNG Terminal and Power Plant scenarios with LNG ship offloading, hoteling operations and marine vessels associated with LNG ship movements in the Project Area, specifically assist tugs and USCG security and patrol boats within the safety and security zone. The modeling assumptions, procedures and results are summarized in this Resource Report. A compact disk containing all modeling input and output files is also provided in Appendix 9B. In the event that AES decides to construct and operate the Power Plant and is required to perform an air quality impact analysis satisfying all requirements for PSD review, AES will perform the required PSD modeling analyses and submit a detailed modeling report as part of the permit application to the MPSC and MDE.

9.3.5.1 Air Quality Modeling Analysis

Atmospheric dispersion modeling was performed to evaluate impacts to air quality due to operation of the Project. The modeling was conducted in accordance with objectives and procedures to satisfy NEPA impact assessment criteria, as discussed in several teleconferences with the FERC Staff. In addition, modeling guidance and meteorological input data were obtained through consultation with MDNR's subcontractor, Environmental Resources Management, Inc. (ERM)), responsible for review of air quality impact analyses under MPSC's consolidated licensing program for power plants.

A. Scope and Objectives of Modeling Analysis

Based on the consultation with FERC Staff, three distinct scenarios were modeled for each of the LNG Terminal operating phase options (i.e., with and without the Power Plant):

(Option 1) Without Power Plant:

- LNG Terminal emission sources only
- LNG Terminal emission sources plus LNG ship offloading emissions

- LNG Terminal emission sources, LNG ship offloading plus all other marine vessels within the safety and security zone

(Option 2) With Power Plant:

- LNG Terminal and Power Plant emission sources only
- LNG Terminal and Power Plant emission sources plus LNG ship offloading emissions
- LNG Terminal and Power Plant emission sources, LNG ship offloading plus all other marine vessels within the safety and security zone

The scenarios were identified in this manner consistent with FERC Staff's interpretation of its obligation under NEPA to evaluate potential impacts from both primary and secondary emission sources associated with the Project. FERC Staff further advised that the secondary mobile emission sources included in the modeling should be geographically limited from the turning basin to the berth and include emissions from all LNG ship transit, maneuvering, and hoteling operations, and assist tugs, security and patrol vessel operations in this restricted area. Since the USCG has not yet determined the preliminary extent of the safety and security zone, it was assumed for the purposes of the modeling analysis that it would be defined by a minimum radius of 500 yards from the LNG ship berth. In addition, the USCG will establish a safety and security zone around each LNG ship while it is in transit. For purposes of the modeling analysis and determining the LNG Terminal "fenceline" for restricted public access, this safety and security zone was also assumed to extend 500 yards from each side of the LNG ship. If the safety and security zone ultimately established by the USCG is greater than these assumptions, it would reduce the impacts at fenceline receptors.

Further following FERC Staff guidance to comply with NEPA impact assessment requirements, the modeled impacts were first compared to EPA PSD Significant Impact Levels (SILs). If maximum predicted impacts are less than the applicable SILs, FERC Staff presumes that the source will not cause or significantly contribute to a PSD Increment or NAAQS violation and no further impact assessment is required. If the predicted impacts are greater than SILs, then maximum impacts are added to representative ambient background concentrations and evaluated for compliance with the NAAQS. In addition, if predicted impacts are greater than SILS, FERC Staff has advised AES that it must complete a qualitative cumulative impact analysis by comparing potential emissions from the Project and other new or reasonably foreseeable projects in the region with regional emission inventories.

B. Model Selection

AERMOD (Version 04300), incorporating Plume Rise Model Enhancement (PRIME) downwash algorithms was used in the refined modeling analyses for simple and elevated terrain. The AERMOD model was run using the Lakes Environmental ISC-AERMOD View (version 5.4.0) interface for EPA's ISC and AERMOD models. AERMOD is an EPA-approved refined dispersion model for evaluating impacts of land-based stationary sources. AERMOD with PRIMEPRME is one of the listed refined dispersion models in EPA's *Guideline on Air Quality Models* (40 CFR Part 51 Appendix W, November 2005) that are required to be used for SIP revisions for existing sources and for NSR and PSD programs.

AERMOD with PRIME includes improved building downwash algorithms capable of modeling receptors in both the near-building wake (cavity) and far-building wake regions. The PRIME algorithm takes into account the distance from each building or structure to potentially affected sources in that building's region of influence. The inclusion of the cavity predictions within AERMOD removes a modeling discontinuity that existed with AERMOD without the PRIME algorithm and obviates the need for additional cavity impact analysis using the SCREEN3 or other calculation procedures.

Default AERMOD control options used in the modeling analysis consistent with EPA recommendations include the following:

- Final plume rise at all receptors
- Stack-tip downwash
- Buoyancy-induced dispersion
- Calm wind processing routine
- Default wind profile exponents
- Default vertical potential temperature gradients

C. Emissions and Source Parameters

The emissions and operating scenarios of all sources included in the modeling analysis are described in Section 9.3.2. The specific primary and secondary (mobile marine vessel) emission sources associated with the LNG Terminal, LNG ships and nonjurisdictional Power Plant are summarized as follows:

LNG Terminal:

- Four hot water heaters
- One Fresh water emergency diesel engine fire pump
- Six salt water emergency diesel engine fire pumps
- One emergency diesel engine standby generator
- One heated vent stack
- LNG ship offloading operations

Marine Vessels Associated with LNG Ships:

- LNG ship hoteling operations at berth and in safety and security zone
- Three assist tug boats in safety and security zone
- Two security and patrol boats in safety and security zone

Non-Jurisdictional Power Plant:

- One Combined cycle combustion turbine with heat recovery steam generator (CTG/HRSG)
- One Cooling tower

Detailed assumptions and calculations used to develop emission rates, operating scenarios and other stack parameters are provided in Appendix 9A for each of the emission sources. Table 9.3.7 summarizes the emissions and source parameters used for AERMOD input.

Different source groups were set up in the model in order to predict impacts for each of the modeling scenarios identified in Section 9.3.5.1.A for each of the LNG Terminal options (with and without the Power Plant). These source groups are identified in Table 9.3-8. The source identification numbers (IDs) listed in the table correspond to the stack numbers identified in Table 9.3-7. Additional notes and conservative assumptions used in the modeling are also summarized in Table 9.3-8. For example,

worst-case operating assumptions for the hot water heaters and CTG assume air pollution control system malfunction conditions in one of the hot water heaters for short-term average emission rates, and startup conditions are factored into the annual emission rates. With respect to the CTG/HRSG, the worst-case short-term emission rates from the two CTG manufacturers under consideration were used as model input. In addition, worst-case emissions are based on continuous operation of the CTG and HRSG at 100 percent load at an ambient temperature of -7°F. In the event that AES decides to construct and operate the Power Plant and it is determined to be subject to PSD review, an analysis of impacts over a range of operating loads and ambient temperatures will be conducted as part of the PSD modeling analysis in order to verify the worst-case impact scenario.

D. Good Engineering Practice (GEP) Stack Height Analysis

Building and structure dimensional data for the GEP stack height, cavity and downwash analyses are summarized in Appendix 9B, Table 9B-1. The dimensional data for all significant buildings/structures as well as the layout and orientations on site are based on the site plan and general arrangement plans presented in Resource Report 13, *Engineering and Design Material.* In addition, typical dimensions of LNG ships for input to the models were obtained from plan and elevation drawings and photographs of a range of actual LNG ships currently in use. For purposes of the modeling analyses, two LNG ships were assumed to be at berth at the same time, one in the process of offloading and the other hoteling.[9] To cover the range of sizes of LNG ships that could be accommodated at the LNG Terminal, one ship was assumed to be a 138,000 cubic meter capacity and the other was assumed to be 210,000 cubic meter capacity. In addition, for modeling purposes, an additional position for a 210,000 cubic meter LNG ship in the tuning basin was assumed for one of the two ships at the terminal. The additional position was assumed so that maximum potential emissions from the assist tugs and security and patrol boats operating during the berthing process could be conservatively modeled accounting for the downwash, cavity and wake effects that would result while an LNG ship is at that location.

The buildings and structures were processed using the EPA Building Profile Input Program (BPIP, version 04274) to determine GEP stack heights as well as direction-specific building heights and widths for each 10-degree azimuth direction for each source included in the modeling analysis. BPIP input and output files are included in the modeling CD provided in Appendix 9B. Figure 9.3-2 depicts the BPIP model setup for the identified significant buildings or structures on site. Figure 9.3-3 is a three-dimensional representation of the significant buildings and structures.

GEP stack height calculations were performed with the BPIP program based on the building/structure dimensions and the methodology described in EPA's Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations (June 1985). The GEP stack height calculated for all stacks, with the exception of the assist tugs and security and patrol vessels was approximately 130 meters (427 feet), with some variation due to differences in stack and building/structure base elevations. The significant structures affecting the GEP stack height for each of these stacks were the LNG storage tanks, each with a height of 51.65 meters (169.5 feet). The GEP stack height calculated for the assist tugs and security and patrol vessels was approximately 94 meters (308 feet), based on the dimensions of the LNG ship in the turning basin. Each of the proposed stack heights is less than the calculated GEP stack heights, and the stacks are also located within the 5L zone of influence from the significant structures. Therefore, downwash and cavity zone impact analyses, incorporated in the AERMOD with PRIME model, were performed based on the dimensions of the controlling structures.

E. Meteorological Data and Site Characteristics

For refined modeling, the *Guideline on Air Quality Models* recommends one year of on-site data or 5 years of off-site representative data. For this modeling analysis, 5 consecutive years of meteorological data were provided by MPSC's air quality consultant (ERM) from the closest and most representative National Weather Service (NWS) stations to the LNG Terminal site. Surface data from NWS Station # 93721 (Baltimore Washington International Airport - BWI) and upper air data from NWS Station # 93734 (Sterling, Virginia), both for the years 1990 to 1994, were selected for input to AERMET, a

[9] While berthing of two ships at one time is contemplated in the design of the LNG Terminal, offloading of cargo will only be possible from one ship at a time.

meteorological pre-processor program used in conjunction with AERMOD. BWI is located approximately 15 km (9.3 miles) southwest of the Terminal Site. AES concurs with ERM in considering this station to have surface meteorological data and land use characteristics that are representative of the Terminal Site. Selection of BWI surface data is justified on the basis of spatial and climatological (temporal) representativeness, as well as the ability of the selected site parameters to characterize the transport and dispersion conditions in the area of concern. The representativeness of the data is demonstrated based on: (1) The proximity of the meteorological monitoring site to the area under consideration (BWI is within the modeling domain and only 15 km from the emission sources); (2) the similarity in the complexity of the terrain (both BWI and the area surrounding the LNG Terminal have relatively flat terrain and have similar urban land use); (3) the exposure of the meteorological monitoring site; and (4) the period of time during which data are collected.

ERM processed the raw data with AERMET (Version 04300), the meteorological preprocessor for AERMOD. In accordance with EPA guidance (*AERMOD Implementation Guide, September 27, 2005*), ERM developed the season and sector specific surface inputs (albedo, Bowen ratio, and roughness length) through the use of an in-house software program that assigned these parameters based on land use within a 3 km area surrounding the BWI airport divided into 12 equally-spaced sectors. Land use information was extracted from USGS Composite Theme Grid (CTG) files, and parameter values were assigned based on Tables 4-1 through 4-3 presented in the AERMOD user's guide. The site characteristics by sector and season developed with this approach are summarized in Appendix 9B, Table 9B-4. Land use surrounding BWI is predominately characterized as urban. Therefore, the urban dispersion option was used for the AERMOD modeling and the default value of 1.0 was used for the urban roughness length. In addition, all land-based stationary sources associated with the LNG Terminal were listed as urban sources.

F. Receptors and Terrain Data

A non-uniform polar grid receptor network was initially set up in AERMOD using rings of receptors spaced at 10 degree intervals on 36 radials originating at the approximate center of the LNG Terminal emission sources. A total of 19 receptor rings were defined at the following distances in meters from the origin:

- 0 – 2 km with 100 meter spacing
- 2 – 5 km with 500 meter spacing
- 5 – 10 km with 1,000 meter spacing
- 10 – 16 km with 2,000 meter spacing

The extent of the receptor network was believed to be sufficient to identify the significant impact area with sufficient resolution. In order to import terrain elevations associated with each of the receptors, the polar grid was converted into discrete Cartesian receptors.

The portion of the LNG Terminal located on land will be fenced and not accessible to the general public. In addition, the general public will be restricted access to areas over water surrounding the LNG ships at berth and while in transit. As discussed in Section 9.3.5.1.A., the USCG has not yet determined the preliminary extent of the excluded safety and security zone. However, for the purposes of the modeling analysis, it was assumed that it would be defined by a minimum radius of 500 yards from the LNG ship berth. In addition, the USCG will establish a safety and security zone around each LNG ship while it is in transit. For purposes of the modeling analysis and determining the "fenceline" for restricted public access, this safety and security zone was also assumed to extend 500 yards from each side of the LNG ship. If the safety and security zone ultimately established by the USCG is greater than these assumptions, it would reduce the impacts at fenceline receptors.

A total of 56 discrete receptors were placed along the proposed "fenceline", including 26 primary receptors at each node of the fenceline polygon and 30 receptors at intermediate points between nodes. Discrete Cartesian receptors located within the plant boundary were eliminated, since the property will not be accessible by the general public. Figure 9.3-4 depicts the near-field receptors, fenceline and

plant boundary receptors, with those within the plant boundary eliminated. Figure 9.3-5 depicts the entire receptor network within the modeling domain boundaries.

Terrain elevations at each of the receptor points were specified by importing 7.5 minute USGS Digital Elevation Model (DEM) data into ISC-AERMOD View interface. The DEM data was obtained from www.webgis.com. UTM Zone 18 (NAD27) was used as the common reference for model setup. The method used to select the elevation for each receptor involved importing the highest elevation from within a bounding polygon, where the bounding polygon is defined by half the distance to adjacent receptor grid nodes.

G. Background Air Quality

Modeled pollutant concentrations are added to background air quality data to evaluate compliance with NAAQS. Background air quality data are conservatively used to account for pollutant concentrations that are otherwise not accounted for in single-source or multiple-source modeling analyses. Representative background concentrations were obtained from the average of the most recent available three years of monitoring data (2003-2005) at the three monitoring sites nearest to the LNG Terminal site. Table 9.3-3 (and Appendix 9B Table 9B-5, with all values converted to $\mu g/m^3$) summarizes the background ambient data and the monitoring sites determined to be most representative of the LNG Terminal modeling domain in AQCR 115.

H. Model Results

The AERMOD model was used to predict maximum ambient air quality impacts for each of the scenarios identified in Section 9.3.5.1.A for the LNG Terminal with and without the Power Plant. Model results are summarized for each of the scenarios in Table 9.3-9. Following FERC Staff guidance, maximum impacts were first compared to EPA SILs. If impacts were estimated to exceed the respective SILs, representative ambient background concentrations were then added to modeled impacts and the total concentrations were compared to NAAQS. As summarized in Table 9.3-9, estimated impacts from the LNG Terminal stationary sources with and without the Power Plant are less than respective SILs for SO_2, CO and Pb. When LNG ship offloading emissions are added, only CO and Pb impacts are less than the respective SILs. When secondary (marine vessel) sources are added to the modeling scenarios, only Pb impacts are lower than the SIL. However, when representative ambient background concentrations are added to modeled impacts, compliance with all applicable NAAQS is demonstrated for all pollutants currently included in the Maryland SIP, as shown in Table 9.3-9.

The offsite areas where maximum modeled impacts are predicted to exceed the SILs occur in close proximity to the LNG Terminal. Even with the worst-case scenario involving all LNG Terminal and Power Plant sources, LNG ship offloading and marine vessels, the maximum distances to SILs were all within 1,500 meters from the approximate center of the land-based LNG Terminal sources (within 1,250 meters from the property line) for all pollutants except CO and within 3,000 meters from the center (1,800 meters from the property line) for CO. CO impacts above SILs were exclusively due to estimated emissions from outboard gasoline engines used in security and patrol boats, which have relatively high CO emission factors relative to all other modeled sources.

However, representative 24-hour and annual average $PM_{2.5}$ ambient background concentrations currently exceed the applicable AAQS and AQCR 115 has been designated nonattainment for $PM_{2.5}$. AES understands that Maryland is currently developing a SIP revision to address the NNSR requirements applicable to the annual average standard. However, due to the recent final rule revising the $PM_{2.5}$ 24-hour standard from 65 to 35 $\mu g/m^3$ (effective December 18, 2006), nonattainment designations with respect to the 24-hour standard are pending, as are further SIP revisions to incorporate NNSR requirements for the revised $PM_{2.5}$ 24-hour standard. In addition, an EPA final rule on implementation of the $PM_{2.5}$ standards during the transition period while SIPs are under development is still pending. Therefore, AES understands that demonstration of compliance with the NAAQS currently does not include an analysis of potential $PM_{2.5}$ impacts.

I. Cumulative Impacts Analysis

AES understands that the FERC Staff requires a qualitative cumulative impact analysis where predicted impacts associated with a proposed project exceed the SILs. AES further understands that additional FERC guidance for performing such an analysis is pending as some of the details are being worked out with EPA and affected states. Other similar FERC-jurisdictional projects have performed qualitative cumulative impact analyses by comparing potential direct and indirect emissions from the proposed project under review and other new or reasonably foreseeable projects in the region with regional emission inventories. Based on consultation with FERC Staff, AES understands that FERC Staff likely will use the predicted significant impact area (offsite areas where maximum modeled impacts are predicted to exceed the SILs) to define the geographic region for which AES must identify other new and reasonably foreseeable projects to be included in the cumulative impacts analysis. Pending further guidance, AES also understands that a reasonable approach for assessing the regional significance of cumulative emissions is to compare them to a preliminary threshold equivalent to 10 percent of the county-wide annual emission inventory. A project would not be considered regionally significant if the cumulative emissions were predicted to be less than 10 percent of the existing county inventory.

As discussed in Section 9.3.5.1.H., the worst-case significant impact area based on the modeling results for the scenario involving all primary and secondary emission sources extends less than 3,000 meters for CO and less than 1,500 meters for all other pollutants from the approximate LNG Terminal center point. Furthermore, the modeled significant impact area for CO occurs entirely over water to the west of the LNG Terminal site and the significant impact area for other pollutants occurs over the Sparrows Point Industrial Complex to the east of the LNG Terminal property lines. AES has not identified any new or reasonably foreseeable projects located in these significant impact areas determined by the modeling. Therefore, potential emissions from the Project alone were compared to the most recent available Baltimore County emission inventory (2001) data available from USEPA (http://www.epa.gov/air/data/geosel.html). The Baltimore County emission inventory is summarized in Appendix B Table 9B-9 and the comparison of Project direct and indirect emissions to the County inventory is summarized in Table 9.3-10. The analysis shows that worst-case Project emissions (including the LNG Terminal, Power Plant, LNG offloading and indirect emissions associated with the Project in MD) are estimated to be considerably less than 10 percent of the Baltimore County emission inventory for all pollutants, with the exception of ammonia. Maximum ammonia emissions, due primarily to worst-case ammonia slip emissions from the Power Plant SCR system used to control NO_X emissions, are estimated to be 11.8 percent of the Baltimore County ammonia emissions inventory. Based on this analysis, worst-case direct and indirect emissions from the Project are not considered regionally significant because the significant impact areas are predicted to be close to the LNG Terminal, no other new or reasonably foreseeable sources are expected to be located within the small significant impact area and total Project direct and indirect emissions would be a small percentage of the Baltimore County emissions inventory.

J. Cooling Tower Impact Analysis

If AES decides to construct and operate the Power Plant, a mechanical draft evaporative cooling tower will be used to remove waste heat from the steam condenser cooling water when the Power Plant is operated without LNG send-out (expected to be less than 33 percent of the time if the Power Plant is constructed and operated). Mechanical draft cooling towers can produce environmental impacts due to the liquid water plume coming directly from the tower (known as "drift"), as well as from the secondary liquid water formation caused by the condensation of water vapor ("fogging"). These impacts include: local shading of the sun due to a visible plume, fogging at ground level and ice build-up, and deposition of dissolved salt particles.

A detailed modeling analysis of cooling tower impacts was performed to evaluate the potential for these impacts from operation of the Project using the Seasonal/Annual Cooling Tower Impact (SACTI) model (Version 09-01-86). The SACTI model was funded by the Electric Power Research Institute (EPRI). It is based on studies conducted by Argonne National Laboratory that evaluated the theory and performance of over 30 cooling tower plume and drift models. The SACTI model was used for this analysis because it is a validated cooling tower plume and drift model that has been widely used in preparing environmental assessments of cooling towers for regulatory purposes. The SACTI model

uses cooling tower design and operational data along with hourly meteorological data to predict the probable impact of cooling tower plumes.

The results of the analysis are summarized in Table 9.3-12. In summary, the Power Plant cooling tower was evaluated for environmental impacts using the SACTI model. Based on this analysis, no adverse off-site environmental effects are expected.

Table 9.3-12 – Summary of Cooling Tower Impact Analysis Results

Cooling Tower Impact Description	Estimated Impacts (units based on 5 years of hourly meteorology)	Estimated Location and Extent of Impacts
Plume Fogging	7.2 hours per year	Predominantly within 600 meters west-south-west of the cooling tower.
Rime Icing	0 hours per year	No icing is expected to occur.
Salt Deposition	Maximum 7,231 kg/km^2-month on site	Predominantly within 100 meters of tower and on site.
Plume Shadowing	Maximum 200 hours/5-years	Predominantly within 200 meters west-north-west of tower and on site.
Plume Visibility	Plume typically visible on site when cooling tower is operating (max. 33% of time only if Power Plant is operated)	Visible plume predominantly located onsite with dimensions less than 100 meters in length, 20 to 30 meters in height and 10-15 meters in radius.

9.3.6 Mitigation of Air Quality Impacts

9.3.6.1 Construction Air Quality Impacts Mitigation

The construction of the Project will result in minor, short-term impacts to local ambient air quality. AES has developed the Fugitive Dust Suppression and Monitoring Plan included as Appendix D to control fugitive dust emissions associated with project construction and operation. A summary of the actions that may be used to minimize these impacts is as follows:

- Require contractors to meet all federal, state and local air quality regulations and emission standards applicable to their equipment;
- Apply water or dust suppressants to disturbed areas, as necessary, to reduce vehicle traffic dust;
- Cover open hauling trucks with tarps, as necessary;
- Use paved roads for construction vehicle traffic, wherever practical;
- Limit vehicle speeds as required to reduce dust generation;
- Respond promptly to any significant particulate emission concerns that occur during construction by evaluating the source of emissions and ensuring all practicable mitigation measures are being implemented; and
- Upon completion of construction activity, stabilize disturbed areas.

In addition, mitigation measures required to comply with general conformity will be implemented. These measures include a demonstration of consistency with applicable control measures and regulations that are relied upon in the SIP, a demonstration that direct and indirect emissions have been identified and accounted for in the SIP attainment demonstration or the emissions must be offset through a SIP revision or other enforceable measure so that there is no net increase in emissions.

9.3.6.2 Operational Air Quality Impacts Mitigation

The emissions control systems proposed for the hot water heaters at the LNG Terminal would include low-NO_X burners and/or flue gas recirculation for preliminary NO_X control, SCR for final NO_X control and oxidation catalysts for CO control. The proposed emissions controls and stringent emissions limitations were determined from a review of recent BACT and LAER determinations for similar boilers and preliminary vendor guarantees; they are considered to be state-of-the-art for these types of sources. A tabular summary of the most relevant BACT/LAER determinations from EPA's RACT/ / BACT/ / LAER Clearinghouse (RBLC) is presented in Table 9.3-11. The proposed NO_X, CO, and VOC emissions levels from the hot water heaters are 3, 10, and 10 ppmvd at three percent O_2, respectively. As discussed in Section 9.3.3, these emissions levels will easily comply with applicable federal and state emission standards. The exclusive use of natural gas in these combustion sources will also minimize emissions and impacts of SO_2 and $PM_{10}/PM_{2.5}$.

The emissions control systems proposed for the CTG with HRSG at the Power Plant would include dry low-NO_X combustors (DLN) for initial NO_X control in the CTG, SCR for final NO_X control and oxidation catalysts for CO control. The proposed emissions controls and stringent emissions limitations were determined from a review of recent BACT and LAER determinations obtained from EPA's RBLC for similar combined cycle power plants (see Table 9.3-12) and preliminary vendor guarantees; they are considered to be state-of-the-art for these types of sources. The proposed NO_X, CO, and VOC emissions levels from the CTG with HRSG are 2, 3, and 5 ppmvd at three percent O_2, respectively. As discussed in Section 9.3.3, these emissions levels will comply with applicable federal and state emission standards. The exclusive use of natural gas in these combustion sources will also minimize emissions and impacts of SO_2 and $PM_{10}/PM_{2.5}$.

9.4 Noise Quality

The construction and operation of the Project will generate noise. AES will utilize noise control measures, as necessary, to reduce the potential noise quality impacts to nearby sensitive receptors associated with the Project, consistent with applicable requirements under federal, state, and local regulations and ordinances. This section 9.4 of Resource Report 9:

- Outlines applicable federal, state, and local noise standards;
- Identifies noise sensitive areas (NSAs) and areas of concern identified in the applicable standards;
- Quantifies existing background noise levels;
- Characterizes the potential noise levels associated with construction and operation of the Project and the potential impacts of those levels on nearby sensitive receptors; and,
- Outlines potential mitigation measures that may be implemented during construction and operation of the Project.

9.4.1 Noise Overview

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Human response to noise varies according to the type and characteristics of the noise source, distance between source and receiver, and receiver sensitivity. Sound levels are expressed in units of decibels. The term decibel (dB) implies a logarithmic ratio of the measured pressure to a reference pressure. This reference pressure refers to a pressure just barely detectable by the human ear. The human ear responds differently to sounds at different frequencies. To adjust for the different "loudness" levels as perceived by humans, a standard "A" weighting curve (dBA) is applied to measured sound levels.

Because noise levels can vary over a given time period, they are further quantified using different time weighted sound metrics. Two of these metrics commonly used to relate the time-varying quality of environmental noise to its known effects on people are the equivalent sound level (Leq) and the day-

night sound level (Ldn). Leq is an average of sound energy over a given time expressed in dB. Ldn is a weighted 24-hour average of sound energy that takes into account the time of day the noise is encountered. Late night and early morning (10:00 p.m. to 7:00 a.m.) noise exposures are adjusted by 10 dB, to account for people's greater sensitivity to sound during the nighttime hours.

9.4.2 Regulatory Overview

In 1974, EPA published "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety" (EPA 1974). This publication evaluates the effects of environmental noise with respect to health and safety. The document provides information to help agencies develop noise standards and regulations. EPA recommends that Ldn should not exceed 55 dBA to protect public welfare. FERC has adopted the EPA's recommendations and requires that the sound attributable to new facilities (including LNG terminals) not exceed an Ldn of 55 dBA at the nearest NSA (18 CFR § 380.12(k)(4)(v)(A)); unless such NSAs are established after facility construction. FERC also require that a project not result in a perceptible increase in vibration at any NSA (18 CFR § 380.12(k)(4)(v)(B)).

The State of Maryland's Environmental Noise Act of 1974 limits noise to that level which will protect the health, general welfare, and property of the people of the State. The State of Maryland limits both the overall noise environment and the maximum allowable noise level for residential, industrial, and commercial areas. For residential activities, the overall noise levels are the same as the FERC standard (55 dBA Ldn). Construction and demolition activities are exempt from the limits outlined in Tables 9.4-1 and 9.4-2 during the daytime hours. For construction and demolition activities a person may not cause or permit noise levels which exceed 90 dBA during daytime hours (7:00 a.m. to 10:00 p.m.) or levels specified in Table 9.4-2 during nighttime hours. In addition, while the regulations specify a maximum allowable noise level for pile driving activities, that standard does not apply between the hours of 8:00 a.m. and 5:00 p.m. (COMAR 26.02.03).

Table 9.4-1
State of Maryland Overall Environmental Noise Standards

Zoning District	Level (dBA)	Measure
Industrial	70	Leq(24)
Commercial	64	Ldn
Residential	55	Ldn

Source: Code of Maryland Regulations (COMAR), Title 26.02.03.

Table 9.4-2
Maximum Allowable Noise Levels (dBA) For Receiving Land Use Categories

Day/Night	Industrial	Commercial	Residential
Day	75	67	65
Night	75	62	55

Source: Code of Maryland Regulations (COMAR), Title 26.02.03.
Note: Daytime construction noise limits are 90 dBA for all land use categories.

The State of Maryland's noise standard also states a person may not cause or permit, beyond the property line of a source, vibration of such direct intensity to cause another person to be aware of the vibration by such direct means as sensation of touch or visual observation of moving objects. This is consistent with the FERC regulation (18 CFR § 380.12(k)(4)(v)(B)).

Although Baltimore County, Maryland maintains a planning noise ordinance, the local code does not set strict noise levels or standard not to be exceeded. It does prohibit the establishment of a facility or activity that will generate noise levels that would interfere with the welfare of other nearby land uses (Baltimore County 2006). Both the federal and the state noise regulations are more restrictive and concise than the local ordinance.

9.4.3 Existing Noise Levels

FERC identifies residences, schools, hospitals, churches, and similar uses as NSAs (18 CFR § 380.12(k)(4)). Figure 9.4-1 identifies the nearest NSAs and land uses near the Terminal Site. There are no NSAs within one mile of the proposed LNG Terminal. The nearest NSA (NSA#1) is a Dundalk residence approximately 5,450 feet north of the proposed Terminal Site (distances provided from the Terminal). The other NSAs identified include:

- Edgemere residence (NSA#2) (9,400 feet east);
- Residential Neighborhood adjacent to Veterans Affairs (VA) medical center south of Edgemere (NSA#3) (14,100 feet southeast); and
- Fort Armistead Park South of the Francis Scott Key Bridge (NSA#4) (9,650 feet west).

Ambient noise monitoring was completed over a 24-hour period from October 22 to 23,, 2006. Details regarding these measurements (monitoring duration, equipment, ambient conditions, etc) are included in Appendix 9C, Sparrows Point Project - Site Sound Survey and Noise Impact Evaluation. The monitoring locations are presented on Figure 9.4-1 and the measured daytime and nighttime ambient Leq levels and the Ldn levels are summarized in Table 9.4-3. In addition to noise level measurements, AES identified and recorded the contributing noise sources, along with the prevailing meteorological conditions (Table 9.4-4). Specifically, as shown on Figure 9.4-1, there is a large interstate highway (I-695) located north between the LNG Terminal Site and NSA #1 and industrial (steel mill) operations located northeast between the LNG Terminal Site and NSA #2. As anticipated, these sources dominated the existing noise environment at these locations.

Table 9.4-3
Measured Daytime and Nighttime Noise Levels at Nearest NSA

NSA	NSA Description	Distance and Direction	Leq Daytime	Leq Nighttime	Estimated Overall Ldn
1	Dundalk residence	5,450 Feet north	67.4	58.1	67.7
2	Edgemere residence	9,400 Feet east	65.3	53.1	64.6
3	Residential Neighborhood Adjacent to VA medical center	14,100 Feet southeast	52.5	51.37	58.0
4	Fort Armistead Park	9,650 Feet west	53.4	NA*	59.8

NA = Not available
*nighttime access to the site restricted

Table 9.4-4
Dominant Noise Sources and Meteorological Conditions During Noise Measurements

NSA	NSA Description	Meteorological Conditions	Dominant Sources of Noise
1	Dundalk residence	Partly Cloudy 50-70 °F north wind 0-3 mph	Freeway traffic Local roadway traffic Heavy truck noise Vegetation/ wind noise Mid-altitude aircraft overflights
2	Edgemere residence	Partly Cloudy 60-70 northeast wind 0-3 mph	Distant industrial noise Warning horns Local roadway traffic Dog barking Mid-altitude aircraft overflights
3	Residential Neighborhood adjacent to Veterans Affairs (VA) medical center	Partly Cloudy 60-70 °F east wind 0-5 mph	Distant Steady State Industrial Noise Wind and Vegetation Noise Water and Wave Noise Mid-altitude aircraft overflights Local Vehicle Traffic
4	Fort Armistead Park	Partly Cloudy 60-70 °F southwest wind 0-6 mph	Wind and Vegetation Noise Water and Wave Noise Mid-altitude aircraft overflights Local Vehicle Traffic Nearby Railroad Whistle Stop

For comparison to the State of Maryland noise standards, additional fenceline ambient noise measurements at the proposed Terminal Site property boundaries were taken (Table 9.4-5) on October 23, 2006. During these measurements, the weather was partly cloudy, 50-60 °F, with winds ranging from 5 to 10 miles per hour (generally off the water from the west). Existing sources of noise included non-road vehicles, steam exhaust from steel mill, perimeter road traffic, wind, distant industrial activities, and mid-altitude aircraft overflights.

Table 9.4-5
Measured Noise Levels At Proposed Sparrows Point LNG Terminal Property Boundaries

Fenceline Locations	Description	Adjacent Land Use	Leq
5	southern property boundary	Industrial	57.9
6	eastern property boundary	Industrial	58.4
7	northern property boundary	Industrial	62.4

9.4.4 Noise Impacts

Construction and operation of the Project will have no significant impacts on any NSA, including the closest NSA located within 5,450 feet of the Terminal Site. Noise levels will be below both the federal and state noise control standards. AES intends to comply with all applicable local and state noise regulations outlined in Section 9.4.3. The potential noise impacts associated with the following activities were assessed:

- LNG Terminal and Power Plant construction, and Pipeline construction and commissioning, along the construction right-of-way - including heavy machinery and Horizontal Directional Drilling (HDD) operations;
- Operation of Pipeline facilities including mainline valve facilities and interconnection tie-in locations;
- Operation of the LNG Terminal and Power Plant (including major sheltered and unsheltered noise producing equipment) ; and,

- Dredging operations.

This noise impact evaluation considered significant sound sources associated with the proposed LNG Terminal and optional cogeneration facility that could affect nearby NSAs. All significant sources of noise, their contribution to the overall noise environment, and maximum sound level were estimated for comparison to the FERC and Maryland noise standards. Details of this evaluation are included in Appendix 9C, Sparrows Point Project - Site Sound Survey and Noise Impact Evaluation.

9.4.4.1 Construction

The most likely sources of noise generation during the construction phase of the Project are trenching and pipelaying activities, pile driving and dredging during the construction of the LNG Terminal, and HDD operations at waterbody crossings. The specific impact of construction activities on the nearest receptors will vary during the construction period depending on the type, number, and loudness of equipment in use at any given time.

Individual pieces of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet. With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active construction sites. The zone of relatively high construction noise levels typically extends to distances of 400 to 800 feet from the site of major equipment operations. Locations more than 1,000 feet from construction sites seldom experience substantial levels of construction noise. Table 9.4-6 presents typical noise levels (dBA at 50 feet) that EPA has estimated for the main phases of outdoor construction.

Table 9.4-6
Noise Levels Associated with Outdoor Construction

Construction Phase	Leq (dBA) at 50 feet from Source
Ground Clearing	84
Excavation, Grading	89
Foundations	78
Structural	85
Finishing	89

Source: US EPA, 1971.

Trenching and pipelaying activities will cause temporary increases in ambient noise levels near the construction areas. The majority of the trenching and pipelaying activities will be conducted during daytime hours. At certain locations where traffic and/or road-use restrictions will affect the construction schedule, construction will proceed during late evening hours. Equipment will not be fixed in one location for long durations, but will progress along the construction right-of-way. Trenching and pipelaying noise will be temporary, and will subside at any particular location as construction progresses to subsequent segments of the Pipeline.

Since individual pieces of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet (Table 9.4-6), it is anticipated that levels greater than 90 dBA will be experienced where construction activities will be undertaken within 50 feet of a residence. Noise levels are expected to exceed the State of Maryland's noise standards (90 dBA) and the use of appropriate mitigation measures will be required. As previously indicated any potential impacts associated with these levels are anticipated to be temporary in nature based on transient and mobile nature of the construction equipment and the relatively short time of pipeline construction work sequencing adjacent to any given residential structure. As outlined in Resource Report 8, *Land Use, Recreation and Aesthetics*, AES will incorporate residential mitigation measures for properties where construction will occur within 50 feet of a residence. In addition, AES will file site-specific residential mitigation plans for properties where construction will occur within 25 feet of a residence. These plans will include reporting, monitoring, and mitigation procedures to address specifically noise issues. The period of

construction near the residences will be compressed as much as possible to reduce adverse noise effects to nearby residents.

Construction of the LNG Terminal and Power Plant will similarly cause temporary increases in ambient noise levels. The majority of the construction will be conducted during daytime hours and will be temporary in nature. Pile driving for the LNG storage tank foundations and the pier will generate the most intense noise associated with construction of the proposed facilities. Estimated noise levels associated with the pile driving activities at NSAs are not anticipated to exceed the 90 dBA daytime threshold outlined in the State of Maryland noise regulations (Table 9.4-7). In addition, pile-driving activities are specifically exempted from the noise regulation between the hours of 8:00 a.m. and 5:00 p.m. Pile driving activities are intermittent by nature and will not be conducted during nighttime hours (10:00 p.m. to 7:00 a.m). All other construction activities are anticipated to be quieter than the pile driving activities, and subsequently will not have an adverse effect on nearby land uses or NSAs.

Table 9.4-7
Predicted Sound Levels at Nearest Noise Sensitive Areas and Fenceline Locations Associated with Pile Driving Activities

NSA/ Fenceline Location	Distance and Direction	Predicted Pile Driving Sound Level Leq (dBA)	Maryland Maximum Allowable Noise Limits (dBA)*	Exceeds Maryland Noise Limits [Yes/No]
1	5,450 Feet north	63	90 (55)	No
2	9,400 Feet east	58	90 (55)	No
3	14,100 Feet southeast	55	90 (55)	No
4	9,650 Feet west	58	90 (55)	No
5	southern property boundary	81	90 (75)	No
6	eastern property boundary	86	90 (75)	No
7	northern property boundary	84	90 (75)	No

*daytime limit (nighttime limit)

The Project is anticipated to involve the installation of HDD segments at two river crossings: Susquehanna River (MP 44) and Back River (MP 9) locations. The entry and exit points for the HDDs sites are shown on the Project Alignment Sheets (Appendix 1D), with approximate locations of the closest NSAs shown on Figures 9.4-2 and 9.4-3.

The expected noise impacts from the HDD operations have been quantified using the best information available at this time (regarding typical HDD rig and equipment for drill crossings of this magnitude) and are tabulated below (Table 9.4-8).

Table 9.4-8
Predicted Sound Levels at Nearest Noise Sensitive Areas Associated with HDD Activities

		No Barrier		w/Barriers	
Case	Distance to Nearest NSA [feet]	Leq (dBA)	Ldn (dBA)	Leq (dBA)	Ldn (dBA)
1: Susquehanna - Entrance	300	71	77	32	38
2: Susquehanna - Exit	600	55	62	37	44
3: Back River - Entrance	800	61	68	43	49
4: Back River - Exit	300	62	68	44	50

Noise associated with HDD activities at the Susquehanna entrance location are expected to exceed the FERC 55 Ldn guidelines. With the installation of proper sound-dampening barriers, noise at all other HDD locations is not anticipated to exceed either state of federal noise limits. HDD activities normally proceed according to a 24-hour schedule. Although this will introduce nighttime noise at HDD sites, the 24-hour construction schedule will limit the overall duration of noise associated with these

activities. Any adverse effects that will occur during HDD operations will be of a temporary nature and cease with completion of HDD activities.

AES is currently in the process of evaluating potential mitigation measures due to noise impacts associated with the HDD sites including, but not limited to, the use of mufflers, sound barriers, and equipment and work area enclosures. To comply with state and federal noise standards, sound generating equipment would be partially enclosed with noise barriers at all HDD locations. In addition, at the Susquehanna entrance location, noise monitoring will be conducted in the early stages of construction to confirm whether the construction noise level exceeds the 55 Ldn guidance value (EPA, 1974). If necessary, additional noise control measures will be implemented to reduce construction noise levels to comply with the FERC noise standard. The following mitigation measures also can be employed, if and as necessary, to address noise impacts identified at HDD entry and exit locations:

- Enclose Power Unit – The drilling rig power unit would be enclosed;
- Enclose mud pumps and engines - The mud pumps and engines would be partially or totally enclosed;
- Enclose generator sets - Generator sets would be totally enclosed or acoustically packaged generators would be used;
- Modify back-up alarms - Back-up alarms on mobile equipment would be modified;
- Restrict the use of mobile equipment - Use of mobile equipment would be restricted during nighttime hours;
- Temporary hay bales as noise barriers - Hay bales would be placed on site as a temporary noise barrier when required;
- Place silencers on equipment – Silencers would be placed on all equipment where possible; and/or
- Addressing individual NSA landowner's impacts on a case by case basis with measures up to or including provisions for temporary lodging.

9.4.4.2 Pipeline Facilities Operation

The aboveground facilities proposed for the Project include nine mainline valve facilities, and three interconnection tie-in locations with the Columbia, Transco and TETCO systems. The mainline valve facilities and interconnection tie-in locations will not have loud equipment and will not generate substantial noise during their operation. The Project will not involve the operation of any compressor facilities; therefore, the only detectable noise that will result from operation of the Pipeline facilities will be that associated with intermittent maintenance activity or pressure regulation equipment. Adverse noise effects associated with maintenance activities will be short-term and generally will not be considered significant. AES will evaluate potential impacts and implement mitigating measures (as necessary) associated with the pressure regulating equipment during the detailed engineering.

9.4.4.3 LNG Terminal Facilities Operation

AES modeled noise levels that would be generated by operation of the proposed LNG Terminal and Power Plant. The model receptors were the same NSA locations where ambient noise monitoring was performed to allow a direct comparison with existing noise levels. Sound level data for the proposed equipment were obtained from vendors, calculated using empirical formulas based on process and mechanical equipment data, or from similar projects, and are outlined in Appendix 9C.

Equipment noise levels for the proposed LNG Terminal and Power Plant were combined with the ambient noise levels to estimate future noise levels. Noise levels were subsequently assessed with regard to FERC and the State of Maryland noise standards. The LNG Terminal and Power Plant are in the design stages. Therefore, a complete equipment list and associated manufacturers specifications are not finalized. However, the major noise producing equipment associated with the LNG Terminal and Power Plant will include turbines, transformers, heaters, pumps, compressors, and emergency generator(s). Much of the noise producing equipment will be contained inside shelters that will be

fabricated with noise reducing material. Other potential noise sources such as the natural gas send-out equipment, booster air compressor, and nitrogen compressor will not be contained inside shelters; however, their noise levels are not expected to contribute significantly to the noise environment at nearby NSAs.

Table 9.4-9 presents the results of the modeling along with a comparison with existing ambient levels, the expected noise attributable to the proposed facility, and the increase in ambient levels as a result of adding the LNG Terminal and Power Plant. The results of the noise impact analysis indicate that the noise attributable to the project would be lower than the FERC and State of Maryland's sound level requirement of 55 dBA Ldn at the nearest NSAs. In addition, additional noise due to the proposed facility at all NSAs would be indistinguishable over the existing noise environment. This would be due primarily to the high levels of existing noise at the NSA, the distance between the NSAs and the proposed facility, and the housing of potentially loud equipment. Noise mitigation of the equipment would consist of manufacturer-supplied intake and exhaust mufflers/silencers, and enclosures, if required. Actual results may be different from those obtained from modeling; therefore, a post-construction sound survey will be completed within 60 days of the LNG Terminal's commissioning and service date.

Table 9.4-9
Predicted Ldn Noise Levels at Nearest Noise Sensitive Areas Associated with the Proposed LNG Terminal and Power Plant Facility

NSA	Distance and Direction	Existing Ambient L_{dn} (dBA)	Predicted Facility Contribution L_{dn} (dBA)	Ambient + Facility L_{dn} (dBA)
1	5,450 Feet north	68	45	68
2	9,400 Feet east	65	37	65
3	14,100 Feet southeast	58	31	58
4	9,650 Feet west	60	37	60

The results of the noise impact analysis also indicate that the noise attributable to the LNG Terminal and Power Plant would be lower than the State of Maryland's maximum allowable limits (Tables 9.4-9 and 9.4-10).

Table 9.4-10
Predicted Sound Levels at Nearest Noise Sensitive Areas and Fenceline Locations Associated with the Proposed LNG Terminal and Power Plant Facility

NSA/Fenceline Location	Distance and Direction	Predicted Facility Sound Level Leq (dBA)	Maryland Maximum Allowable Noise Limits (dBA)*	Exceeds Maryland Noise Limits [Yes/No]
1	5,450 Feet north	39	65 (55)	No
2	9,400 Feet east	31	65 (55)	No
3	14,100 Feet southeast	25	65 (55)	No
4	9,650 Feet west	30	65 (55)	No
5	southern property boundary	62	75 (75)	No
6	eastern property boundary	74	75 (75)	No
7	northern property boundary	67	75 (75)	No

*daytime limit (nighttime limit)

The proposed site for the LNG Terminal is in a historically industrial area. Previous and current land uses at, or directly adjacent to, the site include industrial shipyard repair, the former steel mill, ship decommissioning activities, and an existing power generation facility. These types of activities typically generate industrial noise similar to those associated with the proposed facility. There will be no change in the associated land use category (industrial) and no significant change in the overall noise environment when compared to historical use of the site.

This analysis is very conservative in that it assumes that many pieces of equipment are running at full power, simultaneously, 24 hours a day. It further assumes the surface between the proposed facility and NSA to be a hard surface. It also does not account for noise attenuation due intervening vegetation, other buildings or berms, or masking due to other industrial noises present.

9.4.4.4 Dredging Operations

The Project includes widening and deepening the existing approach channel and turning basin at Sparrows Point to accommodate the larger ships expected at the LNG Terminal than have utilized the existing shipyard, floating dry dock and graving yard/coal channel (south of the proposed LNG Terminal Site). The approach channel expansions will be performed primarily by use of mechanical clamshell dredge or an environmental bucket technology, if required, with some limited areas near shore excavated by backhoe dredge.

Dredging will be completed on a 24-hour basis and will occur closest to NSA#1 and NSA#2, as compared to other Project construction activities. A detailed noise analysis of dredging activities was performed and results are outlined below (Table 9.4-11). Noise attributable to the dredging activities is not anticipated to exceed either the federal or state noise control standards. Additional noise related to dredging activities associated with the LNG Terminal at all NSAs would be indistinguishable over the existing noise environment. This analysis includes a review of both initial construction and future maintenance dredging activities.

Table 9.4-11
Predicted Ldn Noise Levels at Nearest Noise Sensitive Areas Associated with Construction and Maintenance Dredging Activities

NSA	Distance and Direction	Existing Ambient L_{dn} (dBA)	Predicted Dredging Contribution L_{dn} (dBA)	Ambient + Facility L_{dn} (dBA)
1	5,200 Feet north	68	49	68
2	10,600 Feet east	65	38	65
3	14,900 Feet southeast	58	32	58
4	11,700 Feet west	60	36	60

In addition, the results of the noise impact analysis indicate that the noise attributable to the dredging activities at the NSAs would be lower than the State of Maryland's maximum allowable limits (Table 9.4-12).

Table 9.4-12
Predicted Sound Levels at Nearest Noise Sensitive Areas Associated with Construction and Maintenance Dredging Activities

NSA/Fenceline Location	Distance and Direction	Predicted Sound Level Leq (dBA)	Maryland Maximum Allowable Noise Limits (dBA)*	Exceeds Maryland Noise Limits [Yes/No]
1	5,200 Feet north	42	90 (55)	No
2	10,600 Feet east	31	90 (55)	No
3	14,900 Feet southeast	26	90 (55)	No
4	11,700 Feet west	30	90 (55)	No

*daytime limit (nighttime limit)

9.4.5 Noise Mitigation Measures

As part of the LNG Terminal and Pipeline design activities AES is continuing to evaluate noise control measures to be implemented at the LNG Terminal and construction activities associated with the proposed Project. The following is a list of some of the noise control measures AES is evaluating. This list of noise mitigation measures is not an exhaustive list. AES proposes to prevent or minimize noise effects from construction and operation of the Project by:

- Limiting construction primarily to normal weekday daylight or business hours, specifically in areas adjacent to noise sensitive land uses such as residential areas, recreational areas, and any off-post areas, with the exception of HDDs;
- Ensuring construction equipment mufflers will be properly maintained and in good working order;
- Coordinating with residence owners and/or tenants prior to unavoidable construction activities in residential areas;
- Designing the HDD to minimize potential noise and duration of construction;
- Designing the LNG Terminal and Power Plant, through building and other equipment specifications (such as silencers, mufflers, engineered sound enclosures, etc), to mitigate noise and meet or exceed both FERC and the State of Maryland noise standards (information will be incorporated in noise analysis, as available, and will be submitted to FERC as the final project detailed design is completed);
- Enclosing most major noise generating equipment within suitable shelters at the LNG Terminal;
- Within 60 days of completion, performing a post-construction sound survey at the Terminal Site. If the noise attributable to the operation of the terminal or power

generation facility does not fully comply with federal, state and local noise regulations, additional noise controls will be installed within one year of the in-service date to meet this level.

- Sound generating equipment would be partially enclosed with noise dampening barriers at all HDD; and
- At the Susquehanna entrance location noise monitoring will be conducted in the early stages of construction, and, if necessary, additional noise control measures identified in Section 9.4.4.1 will be implemented to reduce noise to meet the FERC noise standards.

9.5 References

1. 40 CFR § 52.21 - Prevention of Significant Deterioration
2. 40 CFR Part 60, Subpart A - General Provisions
3. 40 CFR Part 60, Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units
4. 40 CFR Part 60, Subpart KKKK - Standards of Performance for Stationary Combustion Turbines
5. 40 CFR Part 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
6. 40 CFR Part 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters
7. 40 CFR Part 68 – Chemical Accident Prevention Provisions
8. 40 CFR Part 72 - Permits Regulation (Acid Rain Program)
9. 40 CFR Part 75 - Continuous Emission Monitoring (Acid Rain Program)
10. 40 CFR Part 51 Appendix W, *Guideline of Air Quality Models* (November 2005)
11. AERMOD Implementation Guide, USEPA, September 27, 2005
12. AERMOD User's Guide (US EPA, 2004)
13. American National Standard Institute (ANSI). 2003. American National Standard Quantities and Procedures for Description and Measurement of Environmental Sound. Part 3: Short-term measurements with an observer present. ANSI S 12.9-1993 (R2003)/Part 3.
14. Baltimore County (2006). 1998 Baltimore County Zoning Regulations Edition, v15 Updated 02-15-2006.
15. Code of Maryland Regulations (COMAR). Title 26 Subtitle 02 Chapter 03 Control of Noise Pollution
16. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations (USEPA, June 1985).
17. National Climatic Data Center (NCDC), surface meteorological data for National Weather Service station located at Baltimore-Washington International Airport.

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19. Chapter 01 – General Administrative Provisions

20. Chapter 02 – Permits, Approvals and Registration

21. Chapter 03 – Permits, Approvals and Registrations – Title V Sources

22. Chapter 04 – Ambient Air Quality Standards

23. Chapter 05 – Air Pollution Episode System

24. Chapter 06 – General Emission Standards, Prohibitions and Restrictions

25. Chapter 09 – Control of Fuel-Burning Equipment, Stationary Internal Combustion Engines and Certain Fuel-Burning Installations

26. Chapter 15 – Toxic Air Pollutants

27. Chapter 17 – Requirements for Major New Sources and Modifications

28. Chapter 20 – Mobile Sources

29. Chapter 26 – Conformity

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